THE INFLUENCE OF EMOTIONAL AND CONDITIONAL FACTORS ON GARDENERS' PARTICIPATION IN COMMUNITY GARDENS

A Dissertation

by

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ABSTRACT

In recent decades, there has been considerable attention given to the development of community gardens in many cities. Despite the increasing popularity and the benefits for local communities, the long-time survival of community gardens is under threat and the key issue is a lack of participation over time.

A better understanding of what factors influence gardeners' participation in gardening activities is necessary for designing and implementing appropriate gardening programs and encouraging more stable involvement. The goal of the study was to explore, beyond commonly known functional factors, the impact of emotional and conditional factors on gardening participation, as well as moderating effect of different classifications of gardeners with varying characteristics on their participation. To reach our goal, a web-based survey and on-site surveys were administered to 180 gardeners in three community gardens in Austin, Texas.

Results showed that gardeners were not only driven by functional factors but also emotional as well as conditional factors. The emotional attachment toward gardening was significantly seen in gardeners' high level of place identity and place dependence on gardening place, while the significant conditional factors were seen in gardeners' time constraints rather than the level of gardening skills and physical distance to gardens. The results of motivating factors also showed that both the duration of gardening and the frequency of gardening bolstered gardeners' relationship between emotional factors and their intent to participate in community gardens. The importance of recognizing the diversity of gardeners is discussed as it relates to participation in community gardens.

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CHAPTER I

INTRODUCTION

Community gardens impact people who participate in them in many different ways. Gardens not only provide food, but they also enhance the health of gardeners by providing an outdoor space where they can enjoy their activities. Additionally, gardens improve community integration, enhance neighborhood revitalization, and provide green spaces and local food (Armstrong, 2000; Beilin & Hunter, 2011; Saldivar-Tanaka & Krasny, 2004; Teig et al., 2009). These various benefits of community gardens have influenced many cities to become more supportive of them (Henderson & Hartsfield, 2009; Lawson & Luke, 2012). Despite the many studies on the benefits of community gardens resulting from gardeners' participation, what has not been clearly understood are the factors influencing participation in them.

Researchers and practitioners have sought to identify what motivates people to participate in community gardens[1]. To date, most community garden participation studies have almost exclusively focused on functional (e.g., accessing food, enhancing health) understandings of gardeners' motivations to participate. However, such a functional-focused understanding is not sufficient to understand gardeners' participation (Birky & Strom, 2013; Poulsen et al., 2014). In other words, much attention has been given to how community garden participation is a result of functional factors. However, less clear in regards how gardeners' emotional (e.g., feeling

[1] There is a difference between home gardens, which normally occur in backyards on private property, and community gardens, which are usually cultivated by a group of people, and consist of individually controlled plots within a collectively managed space (Gray, Guzman, Glowa, & Drevno, 2014). Any type of gardening mentioned in this paper is focused on allotment gardens.

attached, self-identity) and conditional factors (e.g., time, gardening skill) influence their participation.

Given this gap in the body of knowledge, the present study particularly focuses on emotional and conditional factors that contribute to gardeners' participation. Furthermore, beyond examining multiple factors influencing participation, different characteristics (e.g., long time gardeners vs. newer gardeners) that gardeners have are also of interest here to fully understand what drives them to be engaged in gardening. This question stems from the recognition that literature has considered community gardeners as a homogeneous group, failing to recognize the diversity of gardeners. In light of this gap, different classifications of gardeners with varying characteristics were studied.

We expect that the study findings will contribute to the work of both academics and practitioners. Academics can benefit from an understanding of the emotional and conditional factors that motivate gardeners to participate in community gardens in addition to the different characteristics of gardeners. From the view point of community garden managers, this study helps to better design gardening programs and encourage more stable involvement. Thus, exploring the impact of emotional and conditional factors on gardening participation, as well as moderating the effect of gardeners' different characteristics on their participation, may provide a better understanding of what motivates gardeners to participate in gardening in a sustainable way.

Problem Statement

In recent decades, there has been considerable attention given to the development of community gardens in many cities. Despite a growing number of community gardens, their long-

time survival is under threat (Lawson, 2004; Pearson & Firth, 2012). According to a report conducted by the American Community Garden Association, 1,615 community gardens disappeared between the years 2007 to 2012 in the United States only. An important finding in this report shows that the key issue hindering the survival of community gardens is a lack of participation over time followed by short-term land tenure and unsecure funding (Drake & Lawson, 2014; Ghose, 2005).

Past studies examining the factors that lead to gardening participation identified diverse functional factors including accessing food, keeping physical health, enjoying being outdoors, and socializing with neighbors. However, existing literature has not examined gardeners' emotional and conditional factors, which, I believe, may impact their participation. I seek to fill this literature gap by identifying emotional and conditional factors that predict participation in gardening activities. More importantly, this study seeks to examine how different characteristics of gardeners influence gardeners' participation in community gardens.

The following research questions are examined in this study:

- What is the role of emotional factors in predicting participation in community gardens?
- What is the role of conditional factors in predicting participation in community gardens?
- How are emotional factors different for different types of gardeners?
- How are conditional factors different for different types of gardeners?

Organization of the Dissertation

This dissertation consists of six chapters – the Introduction, Literature Review, Framework for analysis, Research Method, Results, and Conclusion. The introduction highlights

the gaps in the body of community gardening literature including the contributions of this research. Based on the literature gap, this study provides four research questions and the objectives of this study. The literature review describes recent proliferation of community gardening movement along with the benefits and challenges to sustaining community gardens. More importantly, the foundational and newly emerging community gardening motivations including diverse characteristics of gardeners are described for the investigation of this study. Based on the theoretical framework, the next chapter shows how to investigate this study. Research method includes descriptions of three community garden sites, the data collection procedure, survey measurement, and plans for data analysis. The result section reports preliminary test for comparing data sets collected from three community gardens, profile of respondents, bivariate analysis, multivariate analysis, and moderator analysis. The conclusion chapter analyzes the result findings of this study, connects previous findings, and further provides theoretical and practical implications. Lastly, the limitation of this study and further research are described.

CHAPTER II

LITERATURE REVIEW

The Benefits and Challenges of Community Gardening Programs

Community gardening programs have recently received much attention in cities given the diverse benefits they produce. These benefits can be largely categorized into three aspects: economic, social, and environmental. From the economic perspective, community gardens benefit local governments as well as people who live near community gardens. Community gardens have been shown to increase property values where they are located and spur neighborhood revitalization (Hanna & Oh, 2000; Quastel, 2009). According to the study of community gardens in the New York University School of Law, the property values within a 1,000-foot radius of a garden were higher than the ones outside the radius (Voicu & Been, 2008). In addition, for marginalized communities, community gardens help alleviate the strain on food budget by enabling access to food and vegetables for those who have difficulties affording foods due to absence of grocery markets or lack of transportation (Pagano & Bowman, 2000).

From a social perspective, community development literature has particularly examined how the creation of community gardens plays a role in producing diverse social impacts by employing the concept of social capital. For instance, Glover, Shinew, and Parry (2005) and Glover (2004) showed that gardeners can create new social ties (i.e., linking social capital) and increase connections by interacting with neighbors (i.e., bonding social capital) in community gardens as meeting spaces. Firth et al. (Firth, Maye, & Pearson, 2011) further noted that community gardens enable gardeners to extend their social network to people outside of their gardening communities who generally have interest in growing food and vegetables, thus

'bridging social capital.' These are important because, as studies have shown, a direct link exists between the number of social ties and increased neighborhood attachment, community satisfaction and a sense of community (Alaimo, Reischl, & Allen, 2010; D'Abundo & Carden, 2008; Freudenburg, 1986; Matarrita-Cascante, Stedman, & Luloff, 2010).

From an environmental perspective, community gardening programs are regarded as one type of greening initiative (Ohmer, Meadowcroft, Freed, & Lewis, 2009). This initiative addresses inequitable distribution of green spaces in distressed communities where it is hard to retain open space. Such green spaces serve as public open spaces where people enjoy leisure activities (McIlvaine-Newsad, & Porter, 2013). In addition, community gardens also act as beautification projects typically in cities, which often have a lot of vacant and abandoned lands (Jermé & Wakefield, 2013; Middle et al., 2014). Accordingly, the diverse benefits created from community gardens have led institutions (e.g., Park and Recreation Departments) to support these types of programs by ensuring their existence as permanent sites for public use (Lawson, 2004).

Despite these benefits associated with community gardens, the longevity of community gardens is under threat. Various research findings show that the main aspects that hinder the survival of community gardens are short-term land tenure (Schmelzkopf, 1995; Staeheli et al., 2002), unsecured funding (Ghose & Pettygrove, 2014), and lack of participation by gardeners (Drake & Lawson, 2015). In the case of land tenure, community gardens face short terms as most community gardens are owned by municipalities, institutions, or land trusts and are commonly established as a temporary use for vacant land under threat by potential private developers (Staeheli, Mitchell, & Gibson, 2002; Lawson, 2004). Since the locations of community gardens are the sites where potential development may occur, securing permanency as an open space is

always a daunting issue. For this reason, most of the community gardens, which have not been permitted by formal organizations, were considered as merely a short-term activity.

In the case of securing funding, the uncertain and unsecure funding jeopardizes the lives of community gardens (Ghose & Pettygrove, 2014), resulting in an inability to provide gardening services (e.g., water, gardening tools, skills). As evidenced by community gardening reports (e.g., Drake & Lawson, 2015; Guitart, Pickering, & Byrne, 2012), community gardens that lack access to resources face challenges for the survival of community gardens. This is because secured funding and good access to resources are required for not only initiating community gardens, but also sustaining them. Consistent funding for accessing resources is the key for survival of community gardens.

Lastly, recent community gardening literature has pointed out that a lack of participation by gardeners is a critical challenge threatening the survival of community gardens (e.g., Chitov, 2012; Mast, 2013; Lawson & Luke, 2012). The literature noted that previously mentioned challenges of sustaining community gardens (e.g., short term land tenure, unsecure funding) have become less of a significant barrier because government support can alleviate these challenges (Drake & Lawson, 2014; Schukose, 2000). Instead, keeping gardeners involved has become the most challenging threat to the longevity of community gardens according to the recent community gardening report conducted by Drake and Lawson (2015).

While a significant number of community garden studies have explored the benefits and challenges of community gardens, what has not clearly emerged in the literature are the factors influencing participation in them. A few motivation studies have previously been operationalized with a unidimensional approach, namely utilizing the functional perspective (Drake & Lawson, 2014; Ghose, 2005). Such a simplistic and narrow approach is not sufficient to take into account

gardeners' complex motivations influencing their participation. This raises questions about what other factors may influence gardeners' participation in community gardens. In addition, we assume these factors can differ depending on the distinctive characteristics of gardeners.

The Effect of Functional Factors on Community Garden Participation

Traditionally, motivation studies have predominantly used the unidimensional approach that focuses on functional values (Monroe, 1990; Zeithaml, 1988). This approach assumes that people are cognitive, have rational views, and that their behavior is driven by functional outcomes for certain goals or needs (Babin et al. 1994). Community garden motivation studies to date have predominately explained gardeners' motivations from a functional perspective (e.g., Birky & Strom, 2013; Draper & Freedman, 2010).

The prominently known functional motivation for participating in gardening is accessing fresh and better tasting food (Armstrong, 2000; Lawson & Luke, 2012; Milbourne, 2012). The need for accessing food has been deemed a primary reason for why people engaged in gardening during and after WWII (Lawson, 2004). A recent report conducted by the American Community Garden Association also showed a similar result - food production and access were still the key reasons for participation in gardening (Lawson & Drake, 2012). Accordingly, the motivation of food production has long been deemed by the community gardening literature as a central objective for participation (e.g., Alaimo, Packnett, Miles, & Kruger, 2008; da Silva, Oliveira Fernandes, Castiglione, & Costa, 2016).

Additionally, gardeners have shown an increased interest in maintaining personal health by participating in community gardens (Armstrong, 2000; Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007). The motivation for health is represented in the literautre in two aspects:

physical and mental health. In terms of the first, gardeners tend to participate and spend time in gardening activities to promote and maintain their physical health (Teig et al., 2009; Wakefield et al., 2007). The increased physical activity engaged in while gardening is regarded as critical in the maintenance of physical health, such as reducing the level of obesity (Armstrong, 2000; Kingsley, Townsend, & Henderson-Wilson, 2009; Twiss et al., 2003). Secondly, psychological well-being is frequently reported as an important motivation of community gardening (Poulsen et al., 2014; Twiss et al., 2003). According to the study conducted by Wakefield (Wakefield et al., 2007), gardeners participate in community gardens to enhance their mental health as the activity allows them to relieve their stress and depression.

Another functional reason includes engaging in community gardening as a source of leisure and recreation. Gardens are seen as places where people enjoy leisure activities and interact with nature as opposed to city life (Shinew, Glover, & Parry, 2004). Other gardeners recognize community gardens as green spaces that satisfy their needs and serve as an alternatives for public parks[2] (e.g., Nordh, Wiklund, & Koppang, 2016). Particularly, the role of green spaces of gardens has been largely acknowledged in low-income communities, which typically have less access to green spaces (e.g., Anguelovski, 2013).

Other functional motivations include gardens serving as meeting spaces where people can interact (Alaimo et al., 2010; Baker, 2004; Saldivar-Tanaka & Krasny, 2004). The result from one empirical research study has shown a high correlation between participating in gardening and gardeners' intention to socialize at the garden (e.g., talk, visitation with other gardeners, and

[2] Middle et al. (2014) differentiated community gardens from a public park (simply a green space) in terms of offering ways in which to communicate with other gardeners.

spending more hours in the garden) (Glover et al., 2005). This is particularly evident in the case of community gardens which hold a variety of social events, such as annual plant sales or potlucks. Previous literature have mentioned that older people (e.g., retirees) tended to participate more in community gardens as a demand for reducing social isolation (Kingsley et al., 2009; Milligan, Gatrell, & Bingley, 2004).

In sum, the functional motivations for participating in community gardens fall into these categories: cultivating fresh food (food), improving physical and mental health (health), engaging in recreational and leisure activities (leisure), and socializing (social). These functional motivations emphasize gardeners' explicit instrumental desires and utilitarian needs. However, the literature tends to overlook other factors beyond functional motivations.

The Effect of Emotional Factors on Community Garden Participation

While the functional motivations have merits for analysis of community garden participation, some recent research (e.g., Birky & Strom, 2013; Poulsen et al., 2014) has pointed out that such a simplistic and narrow view cannot capture a broader understanding of gardeners' participation, such as an emotional dimension. A small but increasing number of recent community gardening studies has argued that gardeners are not just driven by their utilitarian needs, but rather by intrinsic and emotional values, which are shaped by individuals' experience within community garden settings (Dunlap, Harmon, & Kyle, 2013; Nordh et al., 2016).

Despite recent arguments regarding emotional feelings gardeners ascribe toward their gardens, the effect of emotional factors has largely been neglected as an important dimension in the body of community garden studies. To respond to such neglects, a few community gardening studies have explored the emotional factors attributed to community gardens. For example,

according to Korpela, Hartig, Kaiser, and Fuhrer (2001) and Kingsley et al. (2009), restorative environments and therapeutic landscapes in community gardens attract gardeners to be involved in gardening. A large number of gardeners in an interview conducted by Kinsley et al. (2009) responded that a feeling of escape from daily life (e.g., gardens as oases in the city) was a strong motivator, providing urban gardeners with feelings of calmness, relaxation, and comfortableness.

Some recent studies (e.g., Dunlap et al., 2013; Krasny, Crestol, Tidball, & Stedman, 2014) have attempted to examine how place-related emotional feelings affect gardeners' participation. Through interviews, Dunlap et al. (2013) studied how community garden participation (i.e., in the Urban Patchwork project) was shaped by gardeners' experiences and feelings generated from gardening activities. The study findings showed that, while functional outcome (e.g., food produce) was a strong predictor, meanings ascribed to the landscape, which was transformed from underutilized spaces to community gardens, positively influenced gardeners' participation, leading them to actively nurture and maintain their individual plot(s). Although this study was targeted for volunteers, it encouraged future research to confirm the role of emotional factors in influencing garden participation of official garden members.

Furthermore, more influentially, a recent qualitative study conducted by Nordh et al. (2016) found that emotional motivations of gardening outweighed the desires for enjoying leisure activity or food cultivation (i.e., functional motivations). The interviewed gardeners in this study stated that the reason to have an individual plot(s) stemmed from their strong sense of pride and achievement by growing food, leading them to continue to garden with higher responsibilities and ownership of their plot(s) (Nordh et al., 2016).

Most previous studies that emphasized the importance of emotional factors measuring garden participation have been conducted by using qualitative methods, particularly targeting

volunteers (unofficial garden members). In this sense, this study is unique and distinctive in that it seeks to quantitatively investigate the effect of emotional factors influencing garden participation, targeting garden members who participate in gardening on a regular basis. Such a more robust empirical investigation using quantitative methods, confirming the effect of emotional factors, was encouraged by Poulsen et al. (2014) and Nordh et al. (2016).

The Effect of Conditional Factors on Community Garden Participation

While the emotional motivations, in addition to functional motivations, provides a more holistic understanding regarding garden participation, the practical community gardening literature noted that gardeners' participation cannot be comprehensively predicted on the basis of functional and emotional factors. A number of such studies (e.g., Chitov, 2012; Drake & Lawson, 2015; Mast, 2013; Lawson & Luke, 2012) that interviewed garden practitioners and garden managers noted that garden participation is often influenced by conditional factors (e.g., time, weather, distance to gardens). In the studies of the relationships between attitude and behavior, conditional factors are often included when motivations are transient or contingent on a particular situation or particular circumstances (Bearden & Woodside, 1977; Sheth, Newman, & Gross, 1991).

Kingsley et al. (2009) studied the influence of gardeners' health and wellbeing benefits on registering as members of 'Dig In' community garden in Port Melbourne, Australia. They interviewed ten gardeners (i.e., committee members and active gardeners), and the findings showed that time constrains (because of children), infrastructure (e.g., lack of bathrooms), and distance from home were deterrents for participating in community gardens. While non-members

(e.g., volunteers) were not included in the interviews, Kingsley et al. (2009) assumed that such deterrents might prevent them from becoming community garden members.

Milburn and Vail (2010) researched factors that make community garden participation sustainable by interviewing four community garden leaders involved in different organizations (e.g., Park and Recreation Department, non-profit organizations). As an important factor to increase gardeners' sustained interest, Milburn and Vail (2010) noted that gardeners preferred gardens that are in close proximity to where they live, preferably walking and bicycling distance. The importance of physical proximity of gardens on participation is also found in the literature by MacNair (2002) and Hagelman III, Mast, and Hiner (2016).

By surveying 445 community garden organizations across the United States and Canada, the community garden report conducted in 2011-2012 identified some conditional deterrents that cease community garden operation (Drake & Lawson, 2015). The interview results reported that the level of gardening skills as related to the ability to manage pests, invasive plants, heat, and mosquitoes impeded gardeners' participation. These difficulties are also found in the study conducted by Mast (2013) who interviewed 63 gardeners in five community gardens in Austin, Texas. Mast found that gardeners who do not have any knowledge or background of gardening easily lose interest, resulting in quitting gardening.

The report also pointed out the challenges of time commitment to maintain gardening plots (Drake & Lawson, 2015). In a study conducted by Kingsley et al. (2009), the interview findings also noted that most gardeners did not initially acknowledge the time and energy commitment required to maintain their plots. Such time requirement, such as daily and weekly routines of weeding and watering, limited gardeners' community garden involvement. In addition, the presence of children is commonly considered a constraint relating to their parents'

(gardeners) participation; however, some literature (Kingsley et al., 2009; Nordh et al., 2016) noted the motivation to be assigned a plot is often for their children to play at the gardens (e.g., a safe environment for the children).

Other studies found that the strictness of garden rules may decrease the interests in participation (Mast, 2013), including service hours, which are mandatory for all members to contribute their time and energy once a month in order to hold a community space. This is for example the case when gardeners have never experienced or participated in service hours (Drake & Lawson, 2015; Lawson & Luke, 2012).

Although previous community gardening studies acknowledged the conditional factors that deter garden participation, there are deficits in research in regard to examining the effect of conditional factors on garden participation, beyond simply identifying the conditional factors. Furthermore, previous studies used qualitative study methods, mostly interviewing committee members or active gardeners at each garden rather than less active general garden populations. Given the gap, this study seeks to quantitatively investigate the effect of conditional factors on garden participation, targeting all garden members, as other studies noted the importance of empirical evidence by survey methods (Filkobski, Rofè, & Tal, 2016; Nordh et al., 2016).

Different Characteristics of Gardeners

Recent community gardening literature has witnessed the growing diversity of gardeners. Community gardens, traditionally predominantly consisting of older men and lower socio-economic groups mainly driven by a desire of accessing food, have been expanded to include more diverse gardeners that have varying motivations (Birky & Strom, 2013; Kettle, 2014; Northrop, Wingo, & Ard, 2013). Given the growth of diversity of gardeners' characteristics, it is

increasingly important to understand their different motivations as related to their characteristics, which potentially affect participation.

Community gardening studies have frequently noted the existence of socio-economic differences related to gardeners' varying motivations. For instance, marginalized gardeners (e.g., immigrants, unemployed) are more interested in food security, while people who have higher income and education link their gardening activities with their health concerns or producing healthy food (da Silva et al., 2016; O'Neal, 2009; Teig et al., 2009). Some studies (e.g., Eisenberg, 2000) noted that different ethnicity, race or gender affect gardeners' motivations, such as accessing ethnic food; however, a majority of literature nevertheless noted that different motivations are most likely attributed to the differences of socio-economic status (Drewnowski, Darmon, & Briend, 2004; Franco, Nandi, Glass, & Diez-Roux, 2007; Northrop et al., 2013; Shinew et al., 2004).

Gardeners vary considerably with regard to the duration of gardening. While newer gardeners are simply motivated by watching things grow and learning new knowledge related to the growing process, long time gardeners are driven by an experience of interacting with nature and by their personal joy in cultivating flowers and vegetables associated with their sense of pride and accomplishment (Clark & Manzo, 1988; Flachs, 2010; Poulsen et al., 2014). Related to their differing motivations, studies have also contrasted the level of gardening skills, reporting that newer gardeners (less experienced) tend to experience more of a loss of interest, easily resulting in quitting gardening, while long time gardeners (experienced) are more encouraged by personal enjoyment in gardening (CoDyre, Fraser, & Landman, 2015; Poulsen et al., 2014).

A few studies have distinguished gardeners by their varying participation levels. Active gardeners (mostly garden leaders/managers) participate more than other gardeners, based on their

high levels of obligation to maintain their community gardens (Dunlap et al., 2013; Glover et al., 2005). According to Birky and Strom (2013), the criteria to distinguish active gardeners from less active gardeners was set by the number of participation each week; 90% of gardeners (active gardeners) participated at least once each week and 40% of gardeners (very active gardeners) participated more than three times each week. Other studies (e.g., Bartolomei, Corkery, Judd, & Thompson, 2003) exhibited similar patterns of participation distribution of a large number of experienced gardeners and a small number of less experienced gardeners, noting that active gardeners are essential in the sustainability of community gardens.

Despite the growing evidence showing the recognition of different characteristics that gardeners have, a number of studies have still dealt with community gardeners as homogeneous groups, thus limiting studies that examine the relations between gardeners' motivations and their characteristics. The exception includes da Silva's (2016) study that identified that gardeners' motivations differ depending on their different characteristics. While several scholars have focused on gardeners' various motivations associated with their different characteristics (e.g. the duration and frequency of gardening), none of them explored how gardeners' different characteristics play a role in influencing their motivation. In this context, our research seeks to understand and unveil the effect that different characteristics have on garden participation.

Summary

Community garden participation has shifted away from simply accessing food and vegetables. The reasons for participation in community gardens today have become more diverse. Notably greater emphasis to date has been given to functional reasons (e.g., maintain health and enjoy being outdoors). However, it remains unclear whether simply functional

approaches motivate gardeners (Birky & Strom, 2013). Recently, the reviewed literature stresses that community garden participation is not unidimensional, emphasizing important components from the recognition that gardeners' feelings and their conditional factors may play a separate role from functional roles influencing gardeners' motivation (Birky & Strom, 2013; Poulsen et al., 2014). Given this understanding, the role of emotional and conditional factors influencing participation needs investigation.

In addition, previous studies have shown increasing interests in regard to gardeners' different characteristics. The distinctions set by differences of gardeners' duration and frequency of gardening, and their socio-economic status. Understanding such characteristics is important because motivations may differ depending on these differences. Although a few studies have examined gardeners' characteristics and their varying motivations, the existing studies have not provided how the variations play a role in influencing gardeners' participation. Thus, the study investigates the roles of emotional and conditional factors on gardeners' participation, and then the distinctiveness of gardeners is examined to understand how their characteristics influence community garden participation.

CHAPTER III

FRAMEWORK FOR ANALYSIS

Measurement of Community Garden Participation

The understanding of community garden participation has predominantly been conducted in gardeners' motivations, particularly focused on their functional motivations. It is well known that these functional factors motivate gardeners to participate in gardening. Such functional motivations include a desire of cultivating fresh food and vegetables, participating in health and leisure activities, and socializing with neighbors, etc. To date, gardeners' motivations, leading their participation in community gardens, have mostly been explained by functional factors.

Recent community gardening literature (e.g., Birky & Strom, 2013; Poulsen et al., 2014) has incorporated emotional values as important factors predicting community garden participation. For instance, qualitative studies conducted by Kingsley et al. (2009) and Dunlap et al. (2013) showed that gardeners' experiences at the garden and special meanings ascribe to their garden play a role in influencing their participation. Yet, these studies cautioned about the difficulties of measuring emotional factors associated to garden participation, emphasizing the need for more empirical methods to confirm the emotional effect. For this understanding, emotional values are critical for predicting gardeners' participation. However, this study, beyond romantic views of emotional contributions on garden participation, aims to develop a better understanding of garden participation mechanisms by including the understanding of practical challenges that deter garden participation. This is because they are frequently cited in practical community gardening research, potentially impacting gardeners' participation (e.g., Drake & Lawson, 2015; Lawson & Luke, 2012).

In addition, to better understand factors that influence participation in community gardens, participation studies, particularly in the field of community development, were also reviewed. This is because, we believe, community garden participation is relevant to participating in activities in a community. The community development literature has described a variety of factors promoting community participation, but mostly, literature (e.g., Matarrita-Cascante & Brennan, 2012; Matarrita-Cascante & Luloff, 2008) has consistently emphasized the importance of local residents' socio-demographics and their length of residency, as important factors leading community participation.

Conceptual Model

To examine the relationship between gardeners' motivations and their participation in community gardens, a theoretical research model developed by Kiviniemi, Ellis, Hall, Moss, Lillie, Brewer, and Klein (2018) was used (Figure. 1). According to this framework, cognitive values refer to the beliefs that people's involvement is driven by their utilitarian values, expecting perceived outcomes. The affective component[3] refers to feelings or emotions that people experience related to physical activities. As predominantly known, the importance of both constructs motivating a behavior in previous studies, this model developed by Kiviniemi et al. (2018) also suggests that cognitive (i.e., functional goals and needs) and affective predictors (i.e., emotional desire) are essential for understanding people's health behavior. Notably, the essence of this framework is the role of contextual factors; a specific context may influence the effects of both cognitive and affective motivations on health behavior and, most importantly, interaction

[3] Although distinctions between affective and emotional factors are stated in a few cases, our framework deals with two constructs as interchangeable.

between these two motivational factors (Kiviniemi et al., 2018). For instance, the level of worry or perceived risk, as contextual factors, may influence the effects of cognitive and affective factors on risky health behaviors, and the magnitude of contextual factors heavily relies on an individual's prior experience associated with the behavior. Most of the frameworks that included contextual factors have been used when individuals' (or groups') differences are important, which may shape the main effects of both cognitive and affective components on people's decision to motivate a behavior (Motowildo, Borman, & Schmit, 1997). In addition, the inclusion of contextual factors allows for providing a better prediction, particularly when measuring regularly performing behavior because behavior in a routine basis is less likely to be predicted in structured or experimental settings, ignoring contextual settings (Blumenfeld, Pintrich, Meece, & Wessels, 1982; Ouellette & Wood, 1998).

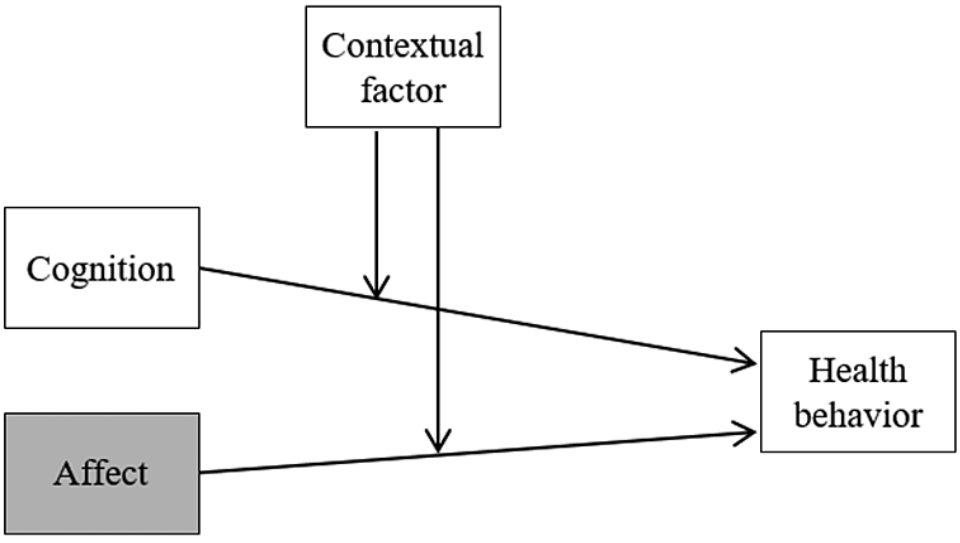

Figure 1 The conceptual model.

Borrowing from this framework, this study aims to develop a more comprehensive model (see Figure 2) to better understand gardeners' participation[4]. As noted earlier, previous community garden studies noting the importance of functional factors have pointed out, there is a need to explore different forms of motivational factors, such as emotional factors. For this reason, we incorporate emotional motivations associated with community garden participation. However, the distinction between the effect of functional and emotional is challenging to define. McVey et a. (2018) found that gardeners' functional motivations (e.g., cultivating food and vegetables) are most often mixed with gardeners' emotional motivations, noting that the emotional feelings gardeners express at the garden are interconnected with functional motivations. In the interest of analytical clarity, however, our analysis considers functional and emotional factors as separate constructs, serving as the basis for our analysis. In addition, this study seeks to extend the currently existing multidimensional framework by including conditional factors (i.e., challenges) as a part of gardeners' motivations. Such an addition has great merit in regard to predicting more accurate garden participation.

The individual differences by gardeners are used as contextual factors, which may moderate the relationships between the major attitudinal dimensions and gardeners' intention to participate in community gardens. As Kiviniemi et al. (2018) emphasized the importance of individuals' differences and their prior experience, this study includes gardeners' distinctive characteristics as contextual factors, such as duration of gardening and frequency of participation. Also, gardeners' socio-demographics are included as antecedents of motivations

[4] Gardeners' participation was measured by gardeners' intention to participate in community gardens because people' intention to participate is commonly known as the precursors of behavior and the most powerful motivating influence on behavior (Bonetti, et al., 2006; Ajzen, 1991).

influencing garden participation as they are important factors influencing community participation in community development literature.

This study, to our knowledge, is the first empirical study to examine the emotional and conditional factors influencing gardeners' participation. Additionally, this study aims to examine the effect of gardeners' different characteristics on their participation in relation to major motivations. For this study, we first examine the emotional and conditional contributions on garden participation. Then, the moderating effect is examined by including different characteristics of gardeners. Figure 2 shows the hypothetical model for the present study.

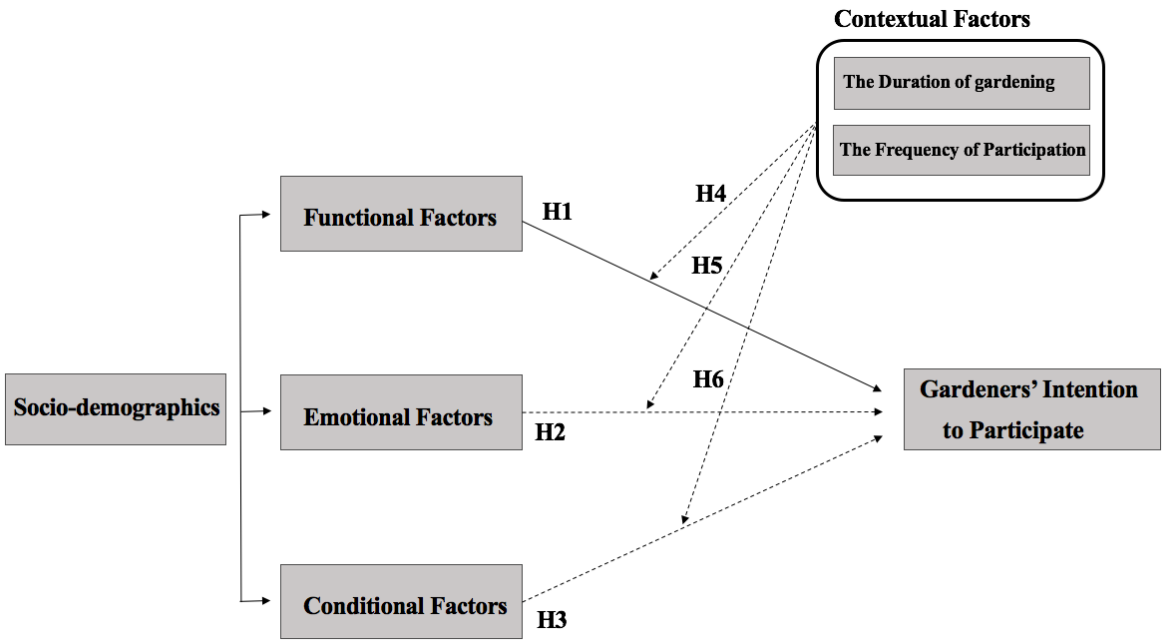

Figure 2 Conceptual model of community garden participation.
Note: Dashed lines indicate the exploratory relationships examined in this study.

Six hypotheses were developed to guide this research (Figure 2):

Hypothesis 1: There is a positive association between functional factors and gardeners' participation.

Hypothesis 2: There is a positive association between emotional factors and gardeners' participation.

Hypothesis 3: There is a negative association between conditional factors and gardeners' participation.

Hypothesis 4: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of functional factors on gardeners' intentions to participate.

Hypothesis 5: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of emotional factors on gardeners' intentions to participate.

Hypothesis 6: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of conditional factors on gardeners' intentions to participate.

CHAPTER IV

RESEARCH METHOD

Site Selection

The study site of this research is community garden in Austin, Texas. The selection of Austin has three reasons. First, the city of Austin recognizes an importance on local food and access to fresh, healthy food ("Sustainable Food Center," 2018). Given a growing interest of local food and access to fresh and healthy food in cities, the city of Austin encourages all residents to participate in urban agriculture opportunities (Gray, 2013). Second, a large number of community gardens is taking place in Austin. There are approximately 63 public community garden projects in Austin (see Figure 3) with support from a variety of non-profit organizations. Among these, the Sustainable Food Center (SFC) serves a major role in helping local people to grow their own food by providing fiscal sponsorships and educational programs including technical assistance. Finally, while there have been much researched in large east or west coast cities (Guitart et al., 2012), there was a limited research from cities in the south.

Community gardens in Austin can be categorized based on needs and missions: communal gardens, allotment gardens, school gardens, and therapy gardens, etc. These diverse types of gardens can be further distinguished into types of land (e.g., private, public, church, school), with a variety of formats, sizes, and organizational structures (Drake, 2014). Due to varying characteristics of community gardens, this study limits itself to allotment gardens, consisting of individual plots for individual gardeners (as opposed to communal gardens that share a single plot). To secure a representative sample of gardeners involved in allotment gardens in Austin, this study selected multiple allotment gardens from diverse neighborhoods. To

select active allotment community gardens for this study, the list of allotment gardens in Austin was examined and was pared down based on 1) the number of officially registered gardeners, 2) the number of garden plots, and 3) the existence of steering committee. These selection criteria resulted in the following three gardens: Sunshine, Festival Beach, and Adelphi Acre Community Garden (see Table 1 and Figure 3).

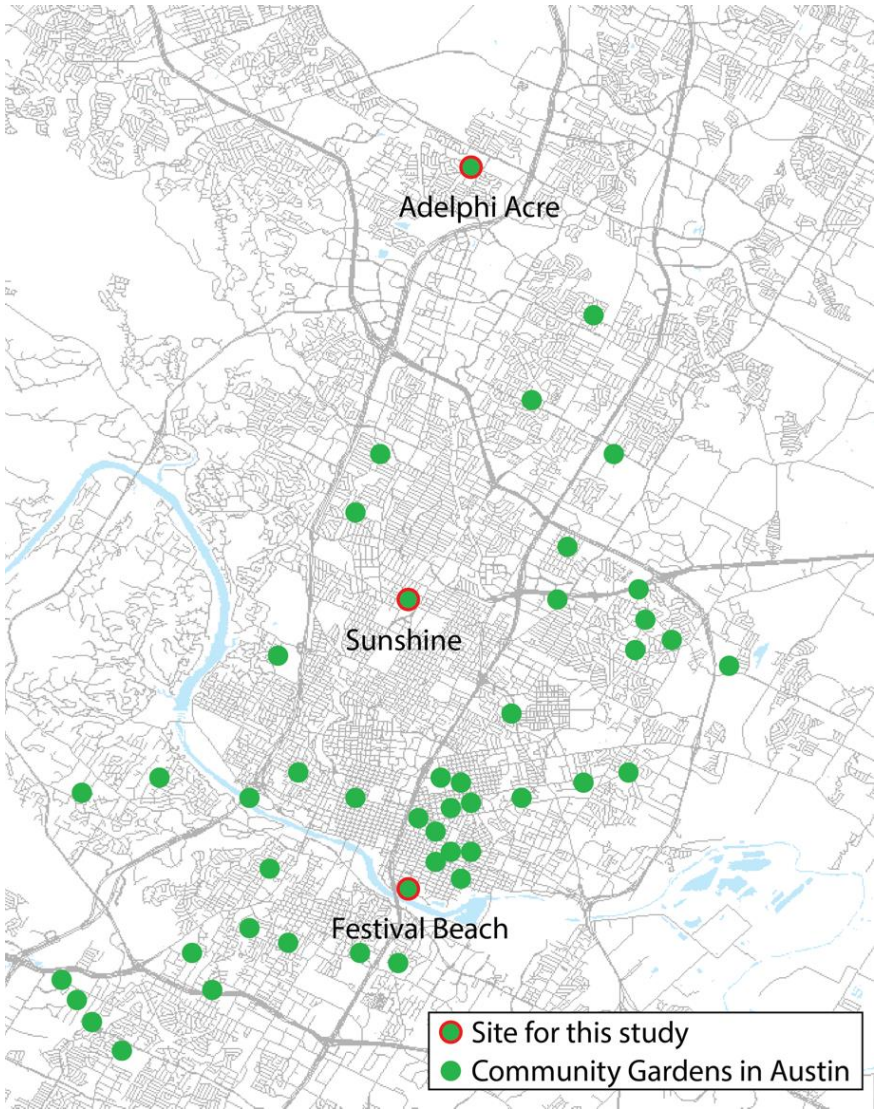

Figure 3 The location of community gardens in Austin based on the three gardens selected in this study

Sunshine Community Garden

The Sunshine Community Garden (SCG) was initiated in 1979 by the Austin Community Garden, the city's first non-profit organization. When the organization was merged into the SFC in 2001, the SCG established their own non-profit organization (i.e., Community Garden Initiative of Central Texas) and has not received outside assistance since then. Located in the center of Austin (Figure 3), the land of the SCG has been leased by the Texas School for the Blind and Visually Impaired (TSBVI) at no cost, and the garden provides students (as members) with educational garden-related programs. The SCG raises money through rental fees; however, most of their revenue come from the Annual Plant Sale every spring, which has become the SCG's primary fundraiser. The SCG is the largest community garden in the nation, situated on four acres of land, and provides over 200 plots for lease, which serve 270 gardeners (Figure 4) ("Sunshine Community Gardens," 2018).

Festival Beach Community Garden

The Festival Beach Community Garden (FBCG) was initiated by the city of Austin in 2010, as city's first effort to encourage the use of city land for community gardens ("Festival Beach Community Garden," 2018). The SFC served as the fiscal sponsor for the garden, and the rental agreement was made between the SFC (as a representative of the garden) and the City of Austin at no costs, which created a collaborative effort between the SFC and the city ("Festival Beach Community dGarden," n.d.). The garden has received an annual fiscal sponsorship from the SFC, which has become a vital element to maintaining the garden. Additionally, Austin Parks and Recreation Department and Austin Parks Foundation are consistently supporting the garden with monetary and gardening tools ("Festival Beach Community Garden," 2018). Adjacent to

Lady Bird Lake (Figure 3), the FBCG currently offers about 80 plots with 90 official garden members in 2-acres of city-owned land (Figure 5).

Adelphi Acre Community Garden

The Adelphi Acre Community Garden (AACG) was initiated in 2014 by neighborhood residents. A few active advocates suggested the creation of community gardens to the city of Austin in a vacant lot where there is a heritage oaks that prevented urban development. With support from the city of Austin (city land) and the SFC (technical support for gardeners), the AACG has been a community garden since 2014 (Garden, 2018). The garden is currently receiving the SFC's annual sponsorship and educational programs (e.g., cooking classes, nutrition education) including technical assistance, but membership and rental fees are vital to the ongoing funding of the AACG. Located in the northern part of Austin (Figure 3), the garden provides 78 plots for lease, serving 94 gardeners in 1.3-acre land (Figure 6).

Figure 4 Sunshine Community Garden

Source: (Google Earth, n.d.)

Figure 5 Festival Beach Community Garden.

Source: (FBCG, n.d.)

Figure 6 Adelphi Acre Community Garden.

Source: (Joplin, 2017)

All three community gardens, as allotment gardens, share similarities in regard to their management and leadership. They are operated through the managing efforts of a volunteer-based committee board (Steering Committee). Also, in regards to ongoing funding, all three community gardens mainly rely on membership fees, donations from outside, and sometimes plant sales (in the case of the SCG). While slight differences exist between the three gardens (e.g., size, land ownership), the selected gardens allow us to help represent the diverse characteristics of gardeners, particularly the allotment gardens in Austin. Details of the three selected community gardens are offered in Table 1.

Table 1 Main characteristics of the study community gardens.

	Sunshine	**Festival Beach**	**Adelphi Acre**
Year established	1979	2010	2014
Plots	200	80	78
Gardeners	270	90	94
Size	4 acres	2 acres	1.3 acres
Location	4814 Sunshine Drive	35 Waller St.	3701 Adelphi Ln
Leadership	Steering Committee	Steering Committee	Steering Committee
Land ownership	School property	City land	City land
Funding	Annual Spring Plant Sale Rental fee	Grant/donation Rental fee	Grant/donation Rental fee
Management organization	Community Garden Initiative of Central Texas	Sustainable Food Center	Sustainable Food Center

Data Collection

Data collection was conducted between November 15 of 2016 and March 10 of 2017 on two phases: via web-based (Qualtrics) and later via on-site surveys. The study population for this study was officially registered gardeners (i.e., garden plot holders or partners of plot holders) at the assigned garden. Gardeners who are under 18 years of age or volunteers are excluded in this survey.

In the first phase, an online survey questionnaire was conducted to garden members in each community garden (Sunshine = 270, Festival = 90, Adelphi Acre = 94). Garden managers, who were highly supportive of the study, in each garden sent an email with a link[5] to the survey to all gardeners by using email addresses managers kept. The email survey with the link was sent on November 15, 2016 with two reminder emails on November 22 and 29 following Dillman's suggestions. Distributing online surveys by managers, instead of by a researcher, seemed more appropriate to decrease the chances of email rejection (e.g., spam or bulk email). Prior to emailing gardeners, the researcher distributed flyers and posted them on the bulletin board in each garden informing them of the study as well as to spur the interest of gardeners (Dillman, 2011).

The second phase of data collection was conducted by administering the face-to-face survey. This type of survey was used to capture the responses from elderly gardeners, which are oftentimes not familiar with using a computer. To administer this survey, the researcher visited each garden twice every month from January to March in 2017 (i.e., January 14 and 28, February

[5] To prevent multiple participations, the "Prevent Ballot Box Stuffing" feature was used within the survey software program (Qualtrics).

4 and 18, and March 4 and 11). The dates were selected based on the schedule of workdays[6] in each garden when gardeners gathered the most at the garden. The researcher approached each gardener and invited them to participate in the study. Gardeners who agreed to take the survey were given an IRB letter of consent explaining the study in detail and instructions for drop box areas where they could leave the completed survey. As followed by Babbie's (2009) guidelines, gardeners were under no obligation to participate in this survey if they did not want to participate. During this process, gardeners who already had filled the online survey and volunteer gardeners who do not have their own individual plots were excluded. While distributing the survey, gardeners who preferred to take the web survey provided an email address and the link to the online survey questionnaire was sent to them. In the case of a few participants (6) who were not able to read English or Chinese (e.g., Burmese speakers), a gardener who worked at the Multicultural Refugee Coalition helped them to answer the questions.

The total data collection (see Table 2) was completed March 11 in 2017. The researcher contacted, via email and in person, a total 454 gardeners, 191 of whom participated in either the online survey or the face-to-face survey. The response rates of each community garden were 33.34 percent (Sunshine), 52.22 percent (Festival Beach), and 57.45 percent (Adelphi Acre). In total this yielded an overall response rate of 42.07%. During the data refinement process, 11 questionnaires were eliminated because of inconsistent and partial responses. In the end, 180 questionnaires were coded for analysis.

[6] Gardeners, as plot holders, are required to be involved in a work day at least 2 hours each month on community garden projects, such as weeding and mulching communal vegetable areas, maintaining the accessible paths, and assisting with the compost. Workday takes place once or twice in a month on Saturday.

Table 2 Survey response rate

Online survey	Sunshine	57
	Festival Beach	31
	Adelphi Acre	36
	Total	124/454 (27.31%)
On-site survey	Sunshine	33
	Festival Beach	16
	Adelphi Acre	18
	Total	67/454 (14.76%)
Total	Sunshine	90/270 (33.34%)
	Festival Beach	47/90 (52.22%)
	Adelphi Acre	54/94 (57.45%)
	Total	191 (42.07%)

Survey Design

The questionnaire was composed of three sections (see Appendix A). In an attempt to reduce the rate of incomplete surveys, respondents were not able to skip the questions in sections 1 (i.e., gardeners' experience at the garden) and 2 (i.e., gardeners' motivations for gardening), while they could skip questions in section 3 (i.e., socio-demographic information) if they were reluctant to answer them.

The survey questionnaire was reviewed by board members in three community gardens to ensure construct validity and enhance its validity of questionnaire format, clarity of items, language and acceptability, and order of items. Then, pilot study was conducted on 28 gardeners involved in Texas Master Gardener Program, a volunteer development program offered by Texas AgriLife Extension Service. This was to further ensure the reliability and modifications were made based on feedback from the pilot test.

The first section was designed to inquire about gardeners' experience with community gardens. First question asked was: "which garden do you belong to?" Then, gardeners were given three options between Sunshine Community Garden, Festival Beach Community Garden, and Adelphi Acre Community Garden. The next question asked gardeners about the duration of gardening in their garden, and to report the length of gardening at their garden (see Table 3). The duration of gardening was assessed in the survey by asking the question "how long have you been gardening in this garden?" ranging from a) = Less than a month, b) = 1 month to 6 months, c) = 7 months to 1 year, d) = 1 to 5 years to e) = More than 6 years. Table 3 shows the result of the duration of gardening.

Table 3 Descriptive statistics for the duration of gardening

		Frequency	Percentage
The duration of gardening	Less than a month	8	4.4
	1 month to 6 months	17	9.4
	7 months to 1 year	25	13.9
	1 to 5 years	89	49.4
	More than 6 years	41	22.8

The duration of reported gardening to their garden showed that the majority of gardeners reported visiting their garden between 1-year to 5-years (49.4%), followed by more than 6 years (22.8%), 7 months to 1 year (13.9%), 1 month to 6 months (9.4%), and less than a month (4.4%).

The survey then asked respondents about their frequency of participation to their garden (see Table 4). Respondents were asked to respond to the question "how many times did you participate in your community garden last month?" ranging from a) = Not at all, b) = 1-2 times,

c) = 3-4 times, d) = 5-6 times, e) = 7-8 times to f) = more than 9 times. Table 4 shows the result of frequency of participation.

Table 4 Descriptive statistics for the frequency of participation.

		Frequency	Percentage
The frequency of participation (times per mCnth)	Not at all	4	2.2
	1-2 times	25	13.9
	3-4 times	46	25.6
	5-6 times	34	18.9
	7-8 times	28	15.6
	More than 9 times	43	23.9

The frequency of reported visits to their garden varied between gardeners. This was broken into two large groups; less active gardeners who participated 3-4 times (25.6%) and active gardeners who participated more than 9 times (23.9%). The rest of the gardeners participated 5-6 times (18.9%), 7-8 times (15.6%), 1-2 times (13.9%), and not at all (2.2%).

The second section of the questionnaire aimed at examining the motivational factors associated with gardening. First, the survey questionnaire for functional factors were selected based on an elicitation study designed by Ajzen and Fishbein (1980). The most frequently mentioned functional motivations were enjoying being outdoors (20.55 %) followed by accessing fresh food (17.81 %), connecting with nature (16.44 %), improving psychological well-being (16.44 %), enhancing bodily health (13.70 %), socializing with other gardeners (8.22 %), and participating in social activities (6.85 %). In the survey, all respondents were asked to rate how important they valued each of seven major functional factors when participating in

their gardens. For example, respondents were asked the question “how important is accessing fresh food by participating in this garden to you?” Then, responses were rated on a 5-point scale ranging from 1 (extremely unimportant) to 5 (extremely important), and the higher score represented the more positive attitude toward participating in community gardens.

Table 5 Descriptive statistics of items used as functional factors

Items	N	Means	S.D.
a. accessing fresh food	180	2.95	.68
b. enjoying being outdoors	180	4.26	.86
e. enhancing bodily health	180	3.89	1.13
d. improving psychological well-being	180	4.13	.91
e. socializing with other gardeners	180	2.91	1.11
f. participating in social activities	180	2.87	1.01
g. connecting with nature	180	3.89	1.09

Table 5 presents the calculated mean and standard deviation of each item. The item “enjoy being outdoors” had the highest mean value of 4.26, followed by “improve psychological well-being” ($\bar{x}$ = 4.13), “connect with nature” and “enhance bodily health” ($\bar{x}$ = 3.89), “access fresh food” ($\bar{x}$ = 2.95), “socialize with other gardeners” ($\bar{x}$ = 2.91), and “participate in social activities” ($\bar{x}$ = 2.87).

Table 6 Factor loadings and reliability for items measuring functional factors.

	Factor loadings	Eigen value	Variance Explained	Cronbach's α
Factor 1: Social interaction		2.020	28.850	.955
a. socializing with other gardeners	.564			
b. participating in social activities	.584			
Factor 2: Outdoor		1.919	27.417	.671
c. enjoying being outdoors	.549			
d. connecting with nature	.507			
Factor 3: Health		1.013	14.469	.651
e. enhancing bodily health	.508			
f. improving psychological well-being	.319			
Factor 4: Food		1.006	14.368	
g. accessing fresh food	.763			
% of variance explained: 85.10% Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .525 Bartlett's Test of Sphericity: 449.741 Significance: < .001				

To identify underlying dimensions among functional factor items, principal component analysis using varimax rotation was performed, with four factors explaining 85.10% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .53, above the acceptable value of .5 (Kaiser, 1974), and Bartlett's Test of Sphericity was significant (χ^2 (21) = 449.741, p < .05). The communalities were all above .3 (see Table 6), further confirming that each item shared some common variance with other items. Given these overall indicators, four factors were obtained from seven items. Since the first two items are related to socializing activities, the first factor was renamed "social interaction." The next two items are associated with enjoying outdoor

in nature and therefore factor 2 was renamed as “outdoor.” The next two items are related to physical and psychological health, thus renamed was renamed as “health.” The last factor was renamed as “food.” This is shown in Table 6. Reliability analysis was performed for internal consistency using Cronbach’s Alpha. A high alpha value was found to be .955 (social interaction), .671 (outdoor), and .651 (health), which were found to have acceptable internal consistency (alpha ≥ 0.6) based on guideline of Francis, Eccles, and Johnston (2004).

Second, emotional factors were measured with place attachment construct because place attachment is generally deemed as equated with the emotional component in place studies (Jorgensen & Stedman, 2001). As far as the questions on place attachment towards participating in community gardens are concerned, the study borrowed 8-items, compromising four items for place identity and four items for place dependence, which were selected as per the relevance of the present study. The place attachment construct used was are used by Kyle, Graefe and Manning (2005), which have been widely adapted and used in a variety of empirical works over time, thus confirming high validity.

The respondents were asked their place identity toward a particular community garden by giving the level which they agree to the following statements: “This garden means a lot to me,” “I am very attached to this garden,” “I strongly identify with this garden,” and “I have special connections to this garden and the people who visit it”. Then, place attachment of particular community garden (i.e., the quality of a setting to satisfy a specific goal) was assessed with another 4 items by giving the level which they agree to the following statements: “I enjoy visiting this garden more than any other gardens,” “I get more satisfaction out of visiting this garden than from any other garden,” “Visiting this garden is more important than visiting any other gardens,” and “I would not substitute other gardens for the activities I do here.” The

responses were rated using 5-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 7 Descriptive statistics of items used as emotional factors

Items	N	Means	S.D.
a. This garden means a lot to me	180	3.75	.66
b. I am very attached to this garden	180	3.64	.67
c. I strongly identify with this garden	180	3.50	.65
d. I have special connections to this garden and the people who visit it	180	3.58	.61
e. I enjoy visiting this garden more than any other gardens	180	3.53	.81
f. I get more satisfaction out of visiting this garden than from any other garden	180	3.54	.79
g. Visiting this garden is more important than visiting any other gardens	180	3.37	.86
h. I would not substitute activities at other gardens for the activities I do here	180	3.22	.87

Table 7 presents the calculated mean and standard deviation of each item. As the result shows, the item "This garden means a lot to me" had the highest mean value of 3.75, followed by "I am very attached to this garden" ($\bar{x}$ = 3.64), "I have special connections to this garden and the people who visit it" ($\bar{x}$ = 3.58), "I get more satisfaction out of visiting this garden than from any other garden" ($\bar{x}$ = 3.54), "I enjoy visiting this garden more than any other gardens" ($\bar{x}$ = 3.53), and "I strongly identify with this garden" ($\bar{x}$ = 3.50). Other two items, "Visiting this garden is more important than visiting any other gardens" and "I would not substitute activities at other gardens for the activities I do here" had lower mean values, 3.37 and 3.22 respectively. Overall, participants expressed strong positive emotional feelings to their garden, but they seemed to be willing to substitute gardening activities in other gardens.

Table 8 Factor loadings and reliability for items measuring emotional factors.

	Factor loadings	Eigen value	Variance Explained	Cronbach's α
Factor 1: Place Identity		3.250	40.626	.850
a. This garden means a lot to me	.667			
b. I am very attached to this garden	.677			
c. I strongly identify with this garden	.642			
d. I have special connections to this garden and the people who visit it	.673			
Factor 2: Place Dependence		2.260	28.251	.836
e. I enjoy visiting this garden more than any other gardens	.662			
f. I get more satisfaction out of visiting this garden than from any other garden	.681			
g. Visiting this garden is more important than visiting any other gardens	.478			
h. I would not substitute activities at other gardens for the activities I do here	.381			
% of variance explained: 68.88% Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .706 Bartlett's Test of Sphericity: 731.594 Significance: < .001				

To test the validity and reliability of measures of the place attachment construct, principal components analysis was performed for the eight items. The initial Eigen value showed that the first factor explained 40.63% of the variance and the second factor 28.25% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .71, and Bartlett's Test of Sphericity was significant (χ^2 (28) = 731.594, $p < .05$). Additionally, the communalities of all items were all above .3 (see Table 8). As expected, two factors were extracted from eight items. The first four items were items for place identity and the next four items were for place dependence. The

reliability tests for internal consistency were performed for each factor using Cronbach's alpha, and both place identity (.850) and place dependence (.836) were found to be acceptable.

Third, the survey questionnaire for conditional factors were selected based on an elicitation study designed by Ajzen and Fishbein (1980). The frequently mentioned conditional factors were lack of time (31.25 %) followed by the ability of managing pest and invasive plants (20.83 %), the level of gardening skills (14.58 %), large plot size to maintain (12.50 %), physical proximity to a garden (10.42 %), and participation for service hours as mandatory (10.42 %). Due to the difficulties of evaluating their conditional factors with self-reported ratings (Kuentzel & McDonald, 1992), the questions of conditional factors included the level of difficulty of each of conditional factors based on gardeners' responses. The questions of conditional factors included, for example, "How often do you feel that distance from a garden make(s) participation in your community garden difficult?" All conditional variables were rated on a five-point Likert scales ranging from 1 (never) to 5 (frequently).

Table 9 Descriptive statistics of items used as conditional factors

Items	N	Means	S.D.
a. lack of time	180	3.81	1.07
b. distance from a garden	180	2.61	.81
c. the difficulty of managing pests and invasives	180	2.79	1.40
d. lack of gardening skills	180	2.37	1.28
e. large plot to maintain	180	1.98	1.21
f. service hours requirements	180	2.82	.96

Table 9 presents the calculated the mean and standard deviation of each item. As shown in the results, “lack of time” had the highest mean value of 3.81, followed by “service hours requirements” ($\bar{x}$ = 2.82), “the difficulty of managing pests and invasives” ($\bar{x}$ = 2.79), “distance from a garden” ($\bar{x}$ = 2.61), “lack of gardening skills” ($\bar{x}$ = 2.37), “large plot to maintain” ($\bar{x}$ = 1.98).

Table 10 Factor loadings and reliability for items measuring conditional factors.

	Factor loadings	Eigen value	Variance Explained	Cronbach’s α
Factor 1: Gardening skill		2.338	38.959	.851
a. the difficulty of managing pests and invasives	.846			
b. lack of gardening skills	.931			
c. large plot to maintain	.854			
Factor 2: Time		1.451	24.179	.612
d. lack of time	.834			
e. service hours requirements	.849			
Factor 3: Distance		1.003	16.721	
f. distance from a garden	.993			
% of variance explained: 79.86% Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .630 Bartlett’s Test of Sphericity: 310.143 Significance: < .001				

To identify underlying dimensions among conditional factor items, factor analysis by using varimax was performed. The initial Eigen value showed that the first factor explained 38.96% of the variance and the second factor explained 24.18% of the variance and the last factor explained 16.72% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .63, and Bartlett’s Test of Sphericity was significant (χ^2 (15) = 310.143, p < .05).

Finally, the communalities were all above .3 (see Table 10), further confirming that each item shared some common variance with other items. Given these overall indicators, three factors were obtained from six items. Since the first three items are related to the ability of gardening and related skills, the first factor was renamed "gardening skill." The next two factors were associated with the time and therefore factor 2 was renamed as "time." The last factor was renamed as "distance." This is shown in Table 9. Reliability analysis was performed for internal consistency using Cronbach's Alpha. A high alpha value was found to be .851 (gardening skill) and .612 (time availability), which were both found to have acceptable internal consistency (alpha $\geq$ 0.6) based on guideline of Francis, Eccles, and Johnston (2004).

Lastly, gardeners' participation was measured by gardeners' intention to participate in community gardens. This is due to the complexities and difficulties of reaching out to past gardeners who do not participate any longer. Instead gardeners' intention to participate was used as a proxy of their future participation because intention is commonly known as the precursors of behavior and the most powerful motivating influence on behavior (Ajzen, 1991; Bonettia et al., 2006). Respondents were asked to rate their level of agreement (strongly disagree = 1 to strongly agree = 5) in terms of how much they were willing to keep participating in community gardening. The following three items[7] were used to assess behavioral intentions: "I intend to keep participating in this community garden," "I have decided to keep participating in this community garden," and "I expect to keep participating in this community garden during the next week."

[7] In order to insure construct validity, guidelines for conducting Theory of Planed Behavior studies given by Ajzen (2006), Ajzen and Fishbein (1980), and Francis et al. (2004) were followed.

Table 11 Descriptive statistics of items used as behavioral intentions

Items	N	Means	S.D.
a. I expect to keep participating in this community garden.	180	4.11	.77
b. I have decided to keep participating in this community garden.	180	3.94	.67
c. I intend to keep participating in this community garden.	180	4.08	.74

Table 11 presents a set of questions to assess gardeners' willingness to keep participating in their garden. As demonstrated in Table 11, "I expect to keep participating in this community garden" had the highest mean value of 4.11, followed by "I intend to keep participating in this community garden" ($\bar{x}$ = 4.08) and "I have decided to keep participating in this community garden" ($\bar{x}$ = 3.94). Overall, the three items showed higher mean values, representing the strong intention to keep gardening in this community garden.

Table 12 Factor loadings for items measuring intention to participate in community gardens.

	Factor loadings	Eigen value	Variance Explained	Cronbach's α
Factor 1: Intent		2.271	75.685	.837
a. I intend to keep participating in this community garden.	.892			
b. I have decided to keep participating in this community garden.	.867			
c. I expect to keep participating in this community garden.	.850			
% of variance explained: 75.685% Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .718 Bartlett's Test of Sphericity: 216.061 Significance: < .001				

For ensure adequate internal consistency, factor analysis was performed for the three items of gardeners' intention (see Table 12). The result of principal component analysis revealed a single dimension to these items, through which 75.69 percent of variance was explained. The Kaiser-Meyer-Olkin test was .72, which ensured the measure of sampling adequacy. Reliability of intention to participate in community gardens was calculated using Cronbach alpha procedures, and the scale was found to have high internal consistency (.837).

The final section of the questionnaire collected respondents' demographic information, including gender, age, highest education level completed, race/ethnicity, number of children, current employment status, and household annual income. All socio-demographic factors play a role in participation in community gardens, but in this study, the greatest interest to us was age, gender, education, employment status, and income.

Data Analysis

A series of analysis steps were conducted to achieve the study objectives and to test the hypotheses. As a first step, all survey responses collected from the three community gardens, by online surveys and face-to-face surveys, were merged to examine this study. As a second step, the descriptive statistics of gardeners' socio-demographic variables were conducted. The demographic profile included gender, age, education level, race, employment status, and household annual income. As a third step, bivariate analysis was conducted to examine the relationships between each independent variable and the dependent variable (i.e., gardeners' intention to participate). Fourth, a series of block model regression analyses (Table 16) was used in order to respond to the first and the second questions of this study (research questions 1 and 2:

what are the role of emotional and conditional factors in predicting participation in community gardens?). The first model examined the predictive values of respondents' socio-demographic information on gardeners' intention for participation. The second model included the variables measuring functional motivations. The third model introduced the variables measuring the emotional motivations. The fourth model introduced the variables measuring the conditional factors. The final or reduced model included only significant variables identified in previous models. Finally, in order to determine the role of different characteristics of gardeners (research question 3 and 4: how are emotional and conditional factors different for different types of gardeners?), the following hierarchical steps were followed. Respondents' socio-demographic information were entered in the first step. The variables measuring major attitudinal dimensions (i.e., functional[8], emotional, and conditional factors) were entered as a block in the second step. Then, different characteristics of gardeners (i.e., duration of gardening, frequency of participation), as moderating variables, were introduced in the third step. The final model introduced the interaction terms (i.e., each independent variable multiplied by the different characteristics of gardeners, i.e., moderator) were included in the fourth step.

[8] To compare with the effects of moderators on the relationships between emotional and conditional motivations and gardeners' intention to participate, this study tested the role of moderators on the relationship between functional motivations and their intention to participate.

CHAPTER V

RESULTS

ANOVA Test for Combining Data

Prior to test the effects of emotional and conditional factors on gardeners' intention to participate, preliminary analysis was conducted. This is because statistical problems may occur when non-homogeneous data are merged to represent a new data set (Citro, 2014; Lohr & Raghunathan, 2017). To test the differences between same variables in three community gardens, this study conducted ANOVA test. If there are significant differences that exist within independent variables (i.e., functional, emotional, conditional) and the dependent variable (i.e., gardeners' intention to participate), combining data sets may not provide accurate and proper data results (Groves & Harris-Kojetin, 2017).

Based on the test of homogeneity of variances (see Table 13), p-values for all variables were not statistically significant at the .05 level, which means that equal variances are assumed (Groves & Harris-Kojetin, 2017). This represents that all above predictors collected in one community garden were not statistically different from data collected from other gardens, which ensure representative sample of allotment gardeners in Austin. Thus, the data sets collected from three gardens were merged to examine gardeners' intention for participation.

Table 13 ANOVA analysis for testing differences between three community gardens

		Mean			Std. Deviation			F/Sig.
		Sunshine	Festival	Adelphi	Sunshine	Festival	Adelphi	
Functional	Access fresh food	2.94	3.04	2.87	0.69	0.71	0.66	.832/.44
	Keep personal health	4.02	3.86	3.74	0.68	0.71	0.75	2.07/.13
	Enjoy being outdoor	4.04	4.18	4.04	0.79	0.81	0.79	.50/.61
	Interact with others	2.83	2.92	2.95	1.02	1.07	1.03	.27/.76
Emotional	Place identity	3.67	3.66	3.52	0.53	0.45	0.60	1.50/.24
	Place dependence	3.40	3.51	3.39	0.75	0.68	0.60	.47/.63
Conditional	Gardening skill	2.33	2.28	2.54	0.93	0.84	0.75	2.7/.07
	Time	3.43	3.07	3.34	1.10	1.07	1.26	.74/.48
	Distance	2.65	2.58	2.58	0.82	0.78	0.82	.18/.83
Intention	Gardeners' intention to participate	4.05	4.13	3.95	0.65	0.60	0.64	.95/.39

Profile of Respondents

The data collection through online survey and face-to-face surveys yielded 180 responses from three community gardens in total, and the response rate was 42.07 percent. Table 14 presents descriptive statistics on socio-demographic variables of survey respondents.

As Table 14 shows, the respondents consisted of 34% (male) and 66% (female) in this study. The most prevalent respondent age category was 50 to 59 years (25.0%), followed by 60 to 69 years (21.7%) and 40 to 49 years (21.7%), reflecting that gardening activities attract older people more than younger people. Also, it was noteworthy that gardeners displayed high levels

of education; 81.1% of gardeners held a 4-year College/University Bachelor's degree or above, 8.9 percent of them had a college degree, 4.4 percent of them had degrees in trade, technical, or vocational training, 3.3 percent had a high school degree or GED, and 0.6 percent had education less than high school. Regarding racial compositions, a high predominance of white respondents (73.3%) was seen in the three studied community gardens; 8.3 percent of them were Hispanic or Latino; 5.6 percent were Asian, and 8.3 percent indicated they belonged to other ethnicity groups. In addition, nearly a half of respondents (47.8%) were currently wage earners, 17.8 percent were self-employed, 16.1 percent were retired, 4.4 percent were students, 3.3 percent were out of work and looking for job, 3.3 percent were a homemaker, 1.1 percent were out of work but not currently looking for job, 1.1 percent were unable to work, and 3.3 percent were in other situations. Regarding the annual income, nineteen respondents neglected to provide information. Among 161 respondents, more than 60% of gardeners earned more than $50,000 per year.

Table 14 Socio-demographic profile of respondents

Variable	Frequency	Percent
Gender		
Male	61	33.9
Female	119	66.1
Total	180	100.0
Age		
19-29	13	7.2
30-39	33	18.3
40-49	39	21.7
50-59	45	25.0
60-69	39	21.7
> 70	10	5.6
Total	179	99.4

Table 14 Continued

Education		
Less than a high school degree	1	.6
High school degree or GED	6	3.3
Some college	16	8.9
Trade/technical/vocational training or associate degree	8	4.4
4-year College/University Bachelor's degree	76	42.2
Advanced degree (Master's, Ph.D., JD, MD)	70	38.9
Total	177	98.3
Race		
Asian	10	5.6
Hispanic or Latino	15	8.3
White/Anglo	132	73.3
Other	15	8.3
Total	176	97.8
Employment Status		
Employed for wages	86	47.8
Self-employed	32	17.8
Out of work and looking for work	6	3.3
Out of work but not currently looking for work	2	1.1
A homemaker	6	3.3
A student	8	4.4
Retired	29	16.1
Unable to work	2	1.1
Other	6	3.3
Total	177	98.3
Household annual income		
Less than $10,000	2	1.1
$10,000 to $14, 999	3	1.7
$15,000 to $24,999	5	2.8
$25,000 to $34,999	12	6.7
$35,000 to $49,999	25	13.9
$50,000 to $74,999	42	23.3
$75,000 to $99,999	35	19.4
$100,000 to $149,999	26	14.4
$150,000 to $ 199,999	7	3.9
$200,000 or more	4	2.2
Total	161	89.4

In order to address the relationships between motivational factors and gardeners' intention to participate, the study examined bivariate and multivariate analyses. The dependent variable (gardeners' intention to participate) was measured with a unidimensional construct, including three items (see Table 11). The mean score created from three items was used as the dependent variable for the bivariate and multivariate analyses. The mean scores for each motivational factor were also calculated and used as independent variables.

Bivariate Analysis

To identify all significant relationships, the study examined the bivariate correlations between each independent variable and the dependent variable. As Table 15 shows, not controlling for other variables, the variable of age was positively related with gardeners' intention for participation ($r = .275$, $p < 0.01$). This indicates that the older the gardeners are, the more likely they are to have an intention to keep gardening. Other socio-demographic variables including employment status, gender, education and household income were not significantly associated with gardeners' intention to participate in community gardens.

Not controlling for other variables, respondents' intention to keep participating in community gardens was significantly associated with most functional variables except the variable of social interaction ($r = .098$, $p > 0.05$). Outdoor ($r = .483$, $p < 0.01$) was found as the most highly correlated variable with gardeners' intention, followed by health ($r = .348$, $p < 0.01$), and food ($r = .157$, $p < 0.05$). This reflects that the desires of enjoying being outdoors, keeping personal health, and accessing fresh food increase gardeners' intention to participate in community gardens.

The variables measuring emotional factors influencing participation in gardening were significantly and positively associated with gardeners' intention to participate in community gardens, not controlling for other variables. Both place identity ($r = .249$, $p < 0.01$) and place dependence ($r = .321$, $p < 0.01$) were positively related to gardeners' intention to continue participating in gardening.

Finally, not controlling for other variables, conditional factors were negatively related to gardeners' intention to participate in community gardens, but only one variable (time) was significant. Time variable was found as negatively correlated variable with gardeners' intention ($r = -.347$, $p < 0.01$), while gardening skill ($r = -.043$, $p > 0.05$) and distance ($r = -.040$, $p > 0.05$) impacting on gardeners' future intention were not statistically related to gardeners' intention.

Besides the relationship with the dependent variable, several significant correlations were found between independent variables. Within socio-demographics, a negative correlation was observed between age and employment ($r = -.376$, $p < 0.01$), assuming that there were older gardeners who were not employed or retired, while a positive correlation was seen between age and health ($r = 195$, $p < 0.01$), assuming that the older gardeners are, the more they are motivated by health issue. In addition, positive correlations were observed between employment status and education ($r = 172$, $p < 0.05$) and income ($r = .374$, $p < 0.01$) as well as between education and income ($r = 430$, $p < 0.01$).

Regarding functional factors, moderate correlations between age and one functional factor ($r = .195$, $p < 0.01$) existed, aligned well with the result of a study conducted by Da Silva et al. (2016). Also, a positive correlation was seen between health and outdoors ($r = .307$, $p < 0.01$). A noteworthy negative correlation was observed between food motivation and income ($r = -.165$,

$p < 0.01$), assuming that gardeners who are employed are less likely to participate in community gardens driven by accessing food.

Regarding emotional factors, overall place identity and place dependence are moderately correlated, evidenced by the r-values of .204 ($p < 0.01$). A moderate correlation was observed between place dependence and one functional factor ($r_{outdoor} = .202$, $p < 0.01$), while no significant correlations were found between place identity and all functional factors.

In the case of conditional factors, moderately negative correlations were found between time and one functional factor ($r_{outdoor} = -.196$, $p < 0.01$) and one emotional factor place dependence ($r = -.191$, $p < 0.05$). Also, another negative correlation was observed between gardening skills and health ($r = -.198$, $p < 0.01$).

Regarding moderator factors, a moderate correlation was existed between duration and frequency ($r = .162$, $p < 0.05$). Both duration and frequency have positive correlations between age ($r_{duration} = .185$, $p < 0.05$; $r_{frequency} = .197$, $p < 0.01$), while a negative correlation existed between employment status and frequency of participation ($r = -.204$, $p < 0.01$).

Table 15 Correlation matrix

	x1	x2	x3	x4	x5	x6	x7	x8	x9
Intention for participation (x1)									
Socio-demographics									
Age (x2)	.275**	-							
Employment (x3)	-.126	-.376**	-						
Gender (x4)	.136	.035	-.144	-					
Education (x5)	.060	.044	.172*	.095	-				
Income (x6)	-.009	.099	.374**	-.077	.430**	-			
Functional motivations									
Food (x7)	.157*	.141	-.024	.097	-.050	-.165*	-		
Health (x8)	.348**	.195**	-.133	-.019	.005	-.030	.026	-	
Outdoor (x9)	.483**	.062	-.080	.053	.042	-.112	.039	.307**	-
Social interaction (x10)	.098	.075	.042	.103	.040	.060	.038	-.103	.051
Emotional motivations									
Place identity (x11)	.249**	.002	-.104	.003	-.096	-.128	-.034	.093	.043
Place dependence (x12)	.321**	.065	-.078	.024	.012	.036	-.140	.024	.202**
Conditional motivations									
Gardening skill (x13)	-.043	-.016	.047	.008	-.014	.093	.020	-.198**	-.144
Time (x14)	-.347**	-.047	.126	-.106	-.012	.095	-.097	-.135	-.196**
Distance (x15)	-.040	-.088	.109	-.011	.052	-.075	-.070	.024	-.046
Moderators									
Duration (x16)	.091	.185*	-.091	-.081	-.094	-.052	.005	-.066	-.016
Frequency (x17)	.143	.197**	-.204**	-.113	-.058	-.103	-.082	.059	.065

Table 15 Continued

	x10	x11	x12	x13	x14	x15	x16	x17
Intention for participation (x1)								
Socio-demographics								
Age (x2)								
Employment (x3)								
Gender (x4)								
Education (x5)								
Income (x6)								
Functional motivations								
Food (x7)								
Health (x8)								
Outdoor (x9)								
Social interaction (x10)								
Emotional motivations								
Place identity (x11)	-.108	-						
Place dependence (x12)	-.006	.204**	-					
Conditional motivations								
Gardening skill (x13)	.034	-.020	-.052	-				
Time (x14)	.021	-.106	-.191*	.050	-			
Distance (x15)	-.017	.010	-.143	.034	.004	-		
Moderators								
Duration (x16)	.014	-.032	-.106	-.008	-.036	-.101	-	
Frequency (x17)	.028	-.030	.089	.079	-.090	-.093	.162*	-

Multivariate Analysis

To examine the causal impact of the three factors (i.e., functional, emotional, conditional factors) on gardeners' intention to participate in gardening (research questions 1 and 2), a block regression model was used. The block regression model included four sequential blocks: 1) socio-demographics, 2) functional factors 3) emotional factors, and 4) conditional factors (see Table 17). The dependent variable was gardeners' intention to participate, and there were 14 independent variables. The first model tested the predictive values socio-demographic variables including age, employment, gender, education, and income. Age was analyzed as a continuous variable[9]: 1) = 19-29 years, 2) = 30-39 years, 3) = 40-49 years, 4) = 50-59 years, 5) = 60-69 years, and 6) = 70 years or older. Gender was coded into dummy variables: 0) = male and 1) = female. Education was coded into six categories: 1) = less than a high school degree, 2) = high school degree or GED, 3) = some college, 4) = trade/technical/vocational training or associate degree, 5) = 4-year college/university bachelor's degree, and 6) = advanced degree (Master's, Ph.D., JD, MD). Employment status was coded to facilitate its interpretation; respondents working as employees and self-employer were classified as 0) = "working" and those not currently in the labor force were classified as 1) = "not working." Income was treated as an interval variable: 1) = less than $10,000, 2) = $10,000 to $14, 999, 3) = $15,000 to $24,999, 4) = $25,000 to $34,999, 5) = $35,000 to $49,999, 6) = $50,000 to $74,999, 7) = $75,000 to $99,999, 8) = $100,000 to $149,999, 9) = $150,000 to $ 199,999, and 10) = $200,000 or more. Before running the regression analysis, several regression assumptions needed to be checked. First, each

[9] Age was treated as a continuous variable because there was a positive correlation between age and dependent variable (i.e., gardeners' intent for participation).

individual error should be independent from other errors, which is called independence of error variables. The Durbin-Watson test is usually used to examine whether the residuals in the model were independent, also known to be an assumption of no autocorrelation (Durbin & Watson, 1951). The score ranges from 0 to 4, and a value of 2 indicates that the residuals are not correlated. According to Pindyck and Rubinfeld (1998), critical values for the Durbin-Watson statistic between 0 and d_u (upper critical values) and between 4- d_u and 4 indicate that the assumption of independence of errors is violated. The critical value of Durbin-Watson test in this study was 2.062 ($d_u = 1.925 < d < 4 - d_u = 2.408$) at the 95% confidence level, which satisfied the assumption of independence of errors (Durbin & Watson, 1951).

Second, the assumption of multicollinearity assumes that there are no independent variables that are linear combinations of other independent variables (Field, 2013); otherwise, it would cause serious problems with the estimation of β and the interpretation, resulting in incorrect conclusions about the relationship between outcome variable and predictor variables (Bowerman & O'connell, 1990; Menard, 1995; Myers, 1990). The VIF statistic (reciprocal of the tolerance statistic) is often used to confirm collinearity in the data. As a rule of thumb, if a VIF is < 10, VIFs are in an acceptable range, indicating a low multicollinearity (Field, 2013). The tests for multicollinearity in the data set revealed a very low level of multicollinearity because the results indicated that the highest VIF value was 1.592.

Third, the assumption of homoscedasticity assumes that the error terms exhibit the similar variance across each level of the independent variables (Tabachnick & Fidell, 2007). Failing to meet the conditions of homoscedasticity (the assumption of equal variance) results in the generation of biased standard errors, leading to incorrect inferences and conclusions. To ensure homoscedasticity, the Breusch-Pagan test is generally used. If the test statistic has a p-

value above 0.05, then the null hypothesis of homoskedasticity is assumed, which is acceptable to run regression analysis (H_0: the error variances are all equal) (Breusch & Pagan, 1979). As seen in Table 16, the p-value for this data set was .350, which suggest that the assumption of homoscedasticity was not violated (Breusch & Pagan, 1979). The Koenker (.354) test also confirms that the assumption of homoscedasticity is satisfied.

Table 16 Breusch-Pagan and Koenker test statistics and sig-values

	LM	Sig.
BP	.874	.350
Koenker	.860	.354

The last assumption for regression analysis is that the errors of a linear regression model should be distributed normally (see Figure 7). The presence of some large outliers cause non-normal residual distribution, and it decreases the accuracy of the prediction intervals (Osborne, 2001). If there are many outliers in the regression line, it means that error distribution is likely to be non-normal, and the confidence intervals will be too wide or narrow (Osborne, 2001). The most commonly used way of confirming normality of the error distribution is the normal probability plot of the residuals by creating a histogram (Figure 7) and a scatter plot (Figure 8). The histogram produced by our data is systemic and almost bell-shaped, and the dots lied almost along the diagonal line. Hence, it is safe to conclude that the assumption of normal distribution of residuals was satisfied (Osborne, 2001). Another way to test normality of the error distribution is to use Kolmogorov-Smirnov Test (Öztuna, Elhan, & Medical, 2006). The null hypothesis for this test is that the distribution of the residuals is normal, indicating that failure to reject null

hypothesis satisfies the assumption of normality of errors. In this data set, the p-value (.100) was greater than the alpha level ($\alpha = 0.01$), which met the assumption of regression analysis (Öztuna et al., 2006). In sum, all assumptions of regression analysis were satisfied: 1) independence of error variables, 2) multicollinearity, 3) homoscedasticity, and 4) normal distributions of errors. None of the conditions violated the assumptions, and the data set conformed to the assumptions of regression analysis.

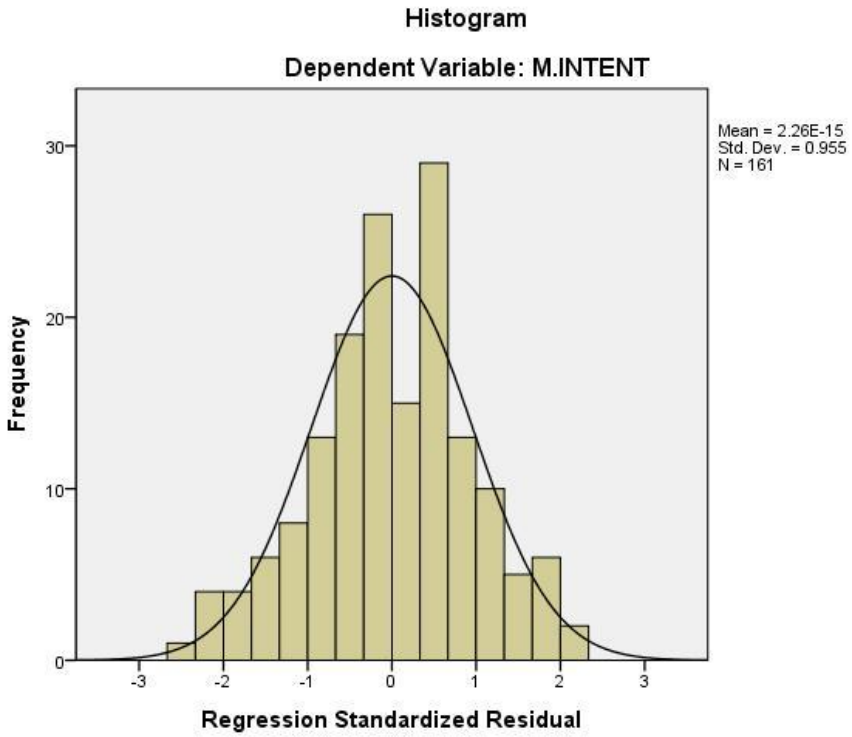

Figure 7 Histogram of normality of residuals

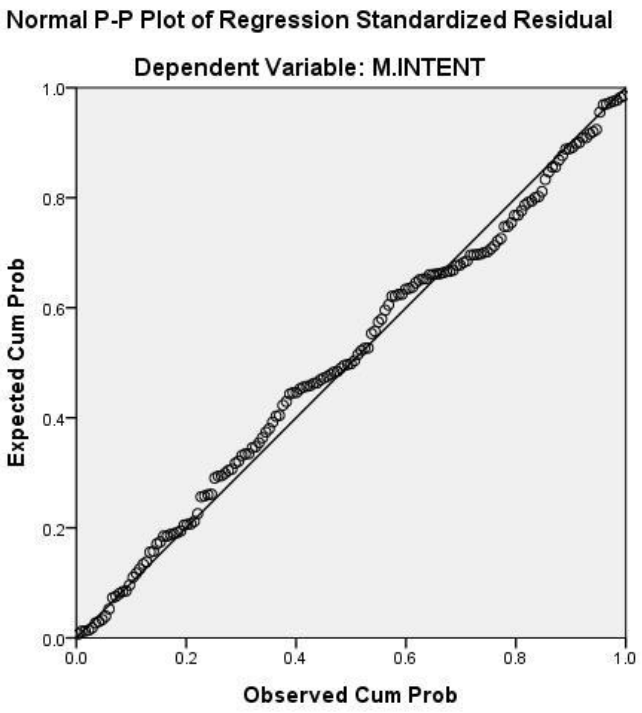

Figure 8 Normal probability plot of Regression Standardized Residual

Upon conducting the block model regression, the socio-demographic block (i.e., age, employment, gender, education, income) was included in Model 1 (See Table 17). A significant regression equation was found ($F(5,155 = 3.419, p < .01$), with an R^2 of .070. When only socio-demographic variables were included, this model explained 7.0 percent of the variance. Age was significantly associated with gardeners' intention to participate ($\beta = .271, p < 0.01$).

In Model 2, the block comprising the functional factors were introduced (See Table 17). Controlling for the sociodemographic variables, motivations for food ($\beta = .144, p < 0.05$), health ($\beta = .168, p < 0.05$), and outdoor ($\beta = .443, p < 0.001$) were significantly and positively related to gardeners' intention for participation. Age ($\beta = .201$), which was significant in the previous model at the level of .01, remained significant at the level of .01. Adding functional factors to the

model significantly increased the proportion of explained variance from that associated with the socio-demographic variables (Adjusted R^2 increased from .070 to .339, $F = 10.13$, $p < 0.001$).

Model 3 introduced the block comprising of the emotional variables (See Table 17). Controlling for the rest of the variables, both place identity ($\beta = .181$, $p < 0.01$) and place dependence ($\beta = .215$, $p < 0.01$) were significantly and positively related to gardeners' intention to participate. Age ($\beta = .191$, $p < 0.01$), food ($\beta = .177$, $p < 0.01$), health ($\beta = .181$, $p < 0.01$), and outdoor ($\beta = .389$, $p < 0.001$) remained significant in this model. Adding emotional factors to the model increased the proportion of explained variance beyond the contribution of the socio-demographic variables and functional variables (Adjusted R^2 increased from .339 to .427, $F = 11.85$, $p < 0.001$).

In Model 4, the block of conditional variables was introduced (See Table 17). Controlling for the rest of the variables in the model, time ($\beta = -.182$, $p < 0.01$) was significantly but negatively related to gardeners' intention to participate, while gardening skills ($\beta = .073$, $p > 0.05$) and distance to garden ($\beta = .003$, $p > 0.05$) were not statistically significant. Age remained statistically significant in this model ($\beta = .186$, $p < 0.01$) as well as the three functional variables that were significant in the previous model ($\beta_{food} = .149$, $p < 0.05$, $\beta_{health} = .178$, $p < 0.01$, $\beta_{outdoor} = .375$, $p < 0.001$). The introduction of the conditional variables to the model slightly increased the proportion of explained variance beyond that of the previous model (Adjusted R^2 increased from .427 to .452, $F = 10.44$, $p < 0.001$).

A final model which included only the statistically significant factors associated with gardeners' intention to participate in community gardens was developed. This model included age, food, health, outdoor, place identity, place dependence, and time. This model was explained 43 percent of variance, and was significant with $F = 19.996$ ($p < .001$).

Adjusting for the effects of the rest of the variables, age was statistically and positively associated with gardeners' intention to participate ($\beta = .185$, $p < 0.01$). This indicates that the older they are, the higher their intention to participate. The result of bivariate analysis ($r = .275$, $p < 0.01$) was inflated because failure to include factors such as functional or emotional factors led the researcher to overestimate the impacts of age.

Adjusting for the effects of the rest of the variables, food was statistically and positively associated with gardeners' intention to participate ($\beta = .126$, $p < 0.05$). This indicates that the greater their desire to access fresh food, the greater their intention to participate. The result of bivariate analysis ($r = .157$, $p < 0.01$) was inflated because failure to include other functional factors such as health or outdoor led the researcher to overestimate the impacts of food.

Adjusting for the effects of the rest of the variables, health was statistically and positively associated with gardeners' intention to participate ($\beta = .156$, $p < 0.05$). This indicates that the greater their desire to improve their health, the greater their intention to participate. The result of bivariate analysis ($r = .348$, $p < 0.01$) was inflated because failure to include factors such as food or outdoor led the researcher to overestimate the impacts of health.

Adjusting for the effects of the rest of the variables, outdoor was statistically and positively associated with gardeners' intention to participate ($\beta = .334$, $p < 0.001$). This indicates that the greater their desire to enjoy being outdoors, the greater their intention to participate. The result of bivariate analysis ($r = .483$, $p < 0.01$) was inflated because failure to include factors such as food or health led the researcher to overestimate the impacts of outdoor.

Adjusting for the effects of the rest of the variables, place identity was statistically and positively associated with gardeners' intention to participate ($\beta = .160$, $p < 0.01$). This indicates that the higher they attribute their identity to their garden, the greater their intention to

participate. The result of bivariate analysis ($r = .249$, $p < 0.01$) was inflated because failure to include factors such as functional factors or socio-demographics led the researcher to overestimate the impacts of place identity.

Adjusting for the effects of the rest of the variables, place dependence was statistically and positively associated with gardeners' intention to participate ($\beta = .183$, $p < 0.01$). This indicates that the higher they rely on their garden, the greater their intention to participate. The result of bivariate analysis ($r = .321$, $p < 0.01$) was inflated because failure to include factors such as functional factors or socio-demographics led the researcher to overestimate the impacts of place dependence.

Adjusting for the effects of the rest of the variables, time was statistically but negatively associated with gardeners' intention to participate ($\beta = -.195$, $p < 0.01$). This indicates that the more gardeners feel time constraints on participating in their garden, the less likely they participate. The result of bivariate analysis ($r = -.347$, $p < 0.01$) was inflated because failure to include factors such as functional factors or emotional factors led the researcher to overestimate the impacts of time.

Table 17 Hierarchy regression analysis for predictors associated with gardeners' intention to participate in community gardens

	Model 1		Model 2		Model 3		Model 4		Model 5	
Socio-demographics										
Age (x2)	.271	**	.201	**	.191	*	.186	**	.185	**
Employment (x3)	-.041		-.015		.018		.041			
Gender (x4)	.108		.093		.088		.071			
Education (x5)	.056		-.007		.012		-.005			
Income (x6)	-.037		.065		.059		.061			
Functional motivations										
Food (x7)			.144	*	.177	**	.149	*	.126	*
Health (x8)			.168	*	.181	**	.178	**	.156	*
Outdoor (x9)			.443	***	.389	***	.375	***	.334	***
Social interaction (x10)			.004		.030		.034			
Emotional motivations										
Place identity (x11)					.181	**	.172	**	.160	**
Place dependence (x12)					.215	**	.180	**	.183	**
Conditional motivations										
Gardening skill (x13)							.073			
Time (x14)							-.182	**	-.195	**
Distance (x15)							.003			
Df	5		9		11		14		7	
Adjusted R2	.070		.339		.427		.452		.428	
F	3.419	**	10.132	***	11.850	***	10.440	***	19.996	***

* $p < .05$ ** $p < .01$ *** $p < .001$

Moderating Analysis

To test the effect of different characteristics of gardeners on the relationships between emotional or conditional factors and their intention to participate (research question 3 and 4), hierarchical multiple regression analysis was conducted. The analysis followed the correct procedure suggested by Baron and Kenny (1986) to confirm the moderating effect. The block regression model included four sequential blocks: 1) socio-demographics, 2) motivation factors (i.e., functional, emotional or conditional) 3) moderator variables, and 4) interaction variables (i.e., each independent variable multiplied by the moderator, or the different characteristics of gardeners). The dependent variable was gardeners' intention to participate.

Gardeners' different characteristics served as moderating variables. Moderators are separate independent variables that affects the strength of relationship between another independent variable and dependent variable. If statistically significant amount of variance in the dependent variable is seen, we can conclude that the moderator effect (i.e., interaction term) is present. As moderator variables[10], the duration of gardening and the frequency of participation were included to test the effect of interaction variables (or terms) in this study. Thus, these analyses aimed to examine, when gardeners have different experience in gardening or when they more often participate at the garden, how the effects of attitudinal factors differ to gardeners' intention to participate.

[10] All moderators were mean centered to prevent multicolliniearity between predictor variables and interaction terms as well as to enhance interpretation of model estimates (Baron & Kenny, 1986). Mean centering was calculated as follows: mc.X (moderator variable) = Scores – mean score.

The Moderating Effects on the Relationship between Functional motivations and Gardeners' Intention to Participate

Our firth hypothesis was that gardeners' distinctive characteristics (i.e., duration of gardening and frequency of participation) may moderate the effect of functional factors on gardeners' intentions to participate. In the case of duration of gardening, interaction terms were created between each of the functional factors and duration of gardening, and the interactions were separately entered in step 3 of the regression (See Table 18). The three functional variables remained significant after introduction of a moderating variable and interaction terms, while none of the interactions were significant and explained significantly more variance than the model without those terms ($\beta_{food*duration} = -.094$, $p > 0.05$, $\beta_{health*duration} = .024$, $p > 0.05$, $\beta_{outdoor*duration} = .015$, $p > 0.05$, $\beta_{socialization*duration} = -.016$, $p > 0.05$). Thus, there were no significant effect of duration of gardening on the relationship between functional factors and gardeners' intention to participate.

Table 18 Hierarchy regression analysis for moderating effects (the duration of gardening) on the relationship between functional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2	Step 3-3	Step 3-4
Constant	3.488	3.485	3.477	3.477	3.490	3.487
Accessing fresh food (mc.x1)	.132*	.135*	.170*	.136*	.135*	.134*
Keeping personal health (mc.x2)	.135*	.147*	.137*	.144*	.150*	.147**
Enjoying being outdoors (mc.x3)	.348***	.351***	.351***	.356***	.351***	.352***
Socializing with other gardeners (mc.x4)	.003	.000	-.006	-.002	.000	-.001
Duration (mc.m1)		.076	.065	.077	.075	.072
mc.x1 * mc.m1			-.091 (-.094)			
mc.x2 * mc.m1				.017 (.024)		
mc.x3 * mc.m1					.013 (.015)	
mc.x4 * mc.m1						-.009 (-.016)
Adjusted R^2	.339	.350	.353	.346	.346	.346
ΔR^2	.277***	.014	.007	.000	.000	.000

* $p < .05$ ** $p < .01$ *** $p < .001$
(Standardized)

Regarding the frequency of garden participation, interaction terms were generated between each of the functional factors and the frequency of garden participation. Each interaction variable was separately entered in step 3 of the regression (See Table 19). The three functional variables remained significant after introduction of a moderating variable and each of the interaction term, while none of the interactions were significant and explained significantly more variance than the model without those terms ($\beta_{food*frequency} = -.053$, $p > 0.05$, $\beta_{health* frequency} = -.095$, $p > 0.05$, $\beta_{outdoor* frequency} = -.041$, $p > 0.05$, $\beta_{socialization* frequency} = -.082$, $p > 0.05$). Similar

with previous result, there were no significant effect of the frequency of gardening on the relationship between functional factors and gardeners' intention to participate.

Table 19 Hierarchy regression analysis for moderating effects (frequency of participation) on the relationship between functional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2	Step 3-3	Step 3-4
Constant	3.488	3.464	3.486	3.472	3.468	3.444
Accessing fresh food (mc.x1)	.132*	.140*	.141*	.137*	.144*	.144*
Keeping personal health (mc.x2)	.135*	.135*	.133*	.146*	.132*	.135*
Enjoying being outdoors (mc.x3)	.348***	.343***	.348***	.333***	.343***	.332***
Socializing with other gardeners (mc.x4)	.003	-.002	-.001	-.004	-.006	.005
Frequency (mc.m2)		.049	.048	.052	.051	.051
mc.x1 * mc.m2			-.033 (-.053)			
mc.x2 * mc.m2				-.058 (-.095)		
mc.x3 * mc.m2					-.023 (-.041)	
mc.x4 * mc.m2						-.036 (-.082)
Adjusted R^2	.339	.347	.345	.352	.344	.349
ΔR^2	.277***	.011	.003	.009	.002	.006

* p < .05 ** p < .01 *** p < .001 (Standardized)

The Moderating Effects on the Relationship between Emotional motivations and Gardeners' Intention to Participate

Our fifth hypothesis was that gardeners' distinctive characteristics (i.e., duration of gardening and frequency of participation) may moderate the effect of emotional factors on gardeners' intentions to participate. In the case of duration of gardening, interaction variables

were created between each of the emotional factors and duration of gardening, and the generated interactions were separately entered in step 3 of the regression (See Table 20). While duration of gardening (i.e., moderator) was not statistically significant in block models, both interaction terms were significant and explained significantly more variance than the model without those terms ($\beta_{PI*duration} = .216$, $p < 0.01$, $\beta_{PD*duration} = .187$, $p < 0.01$). Adding the interaction variable between place identity and moderator to the model increased the proportion of explained variance from that associated with emotional variables and moderator (Adjusted R^2 increased from .194 to .234, $F = 6.437$, $p < 0.01$). Adding the interaction variable between place dependence and moderator to the model also increased the proportion of explained variance from that associated with emotional variables and moderator (Adjusted R^2 increased from .194 to .233, $F = 6.092$, $p < 0.05$).

Table 20 Hierarchy regression analysis for moderating effects (the duration of gardening) on the relationship between emotional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2
Constant	3.370	3.364	3.470	3.435
Place identity (mc.x5)	.212*	.219*	.169	.184*
Place dependence (mc.x6)	.245***	.262***	.241***	.256***
Duration (mc.m1)		.078	.086	.051
mc.x5 * mc.m1			.241** (.216)	
mc.x6 * mc.m1				.154* (.187)
Adjusted R^2	.184	.194	.234	.223
ΔR^2	.120***	.015	.043**	.032*

* $p < .05$ ** $p < .01$ *** $p < .001$
(Standardized)

We executed a simple slope test to determine whether duration of gardening has a significant role as moderator ranging from less experienced (i.e., less than a month) to more experienced (i.e., more than 5 years). Both moderating effects in the case of place identity and place dependence in each are depicted in Figure 9 and Figure 10, in which the X-axis indicates emotional variables and the Y-axis gardeners' intention to participate.

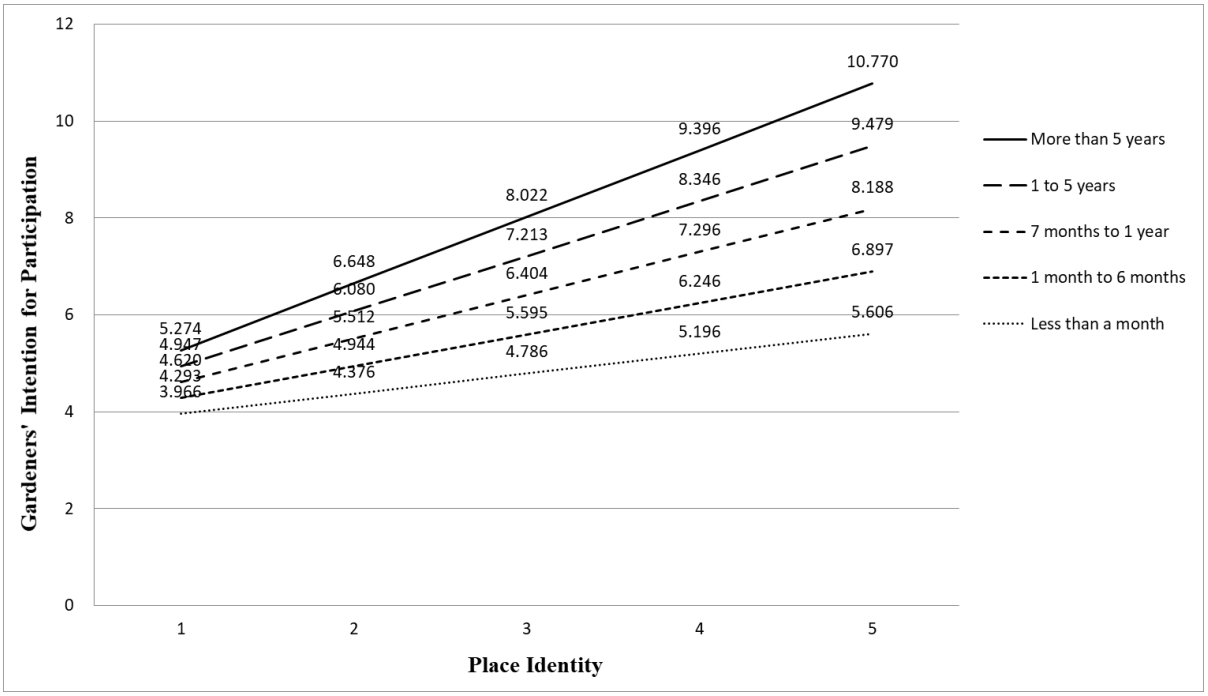

Figure 9 Place identity (IV) * The duration of gardening (M) = Gardeners' intent for participation (DV).

Figure 9 indicates that place identity generally increases gardeners' intention to participate. This effect is facilitated when the duration of gardening is higher, indicating that long time gardeners are influenced more on the effect of place identity than newer gardeners. Thus, the duration of gardening is an important positive factor that increases gardeners' participation.

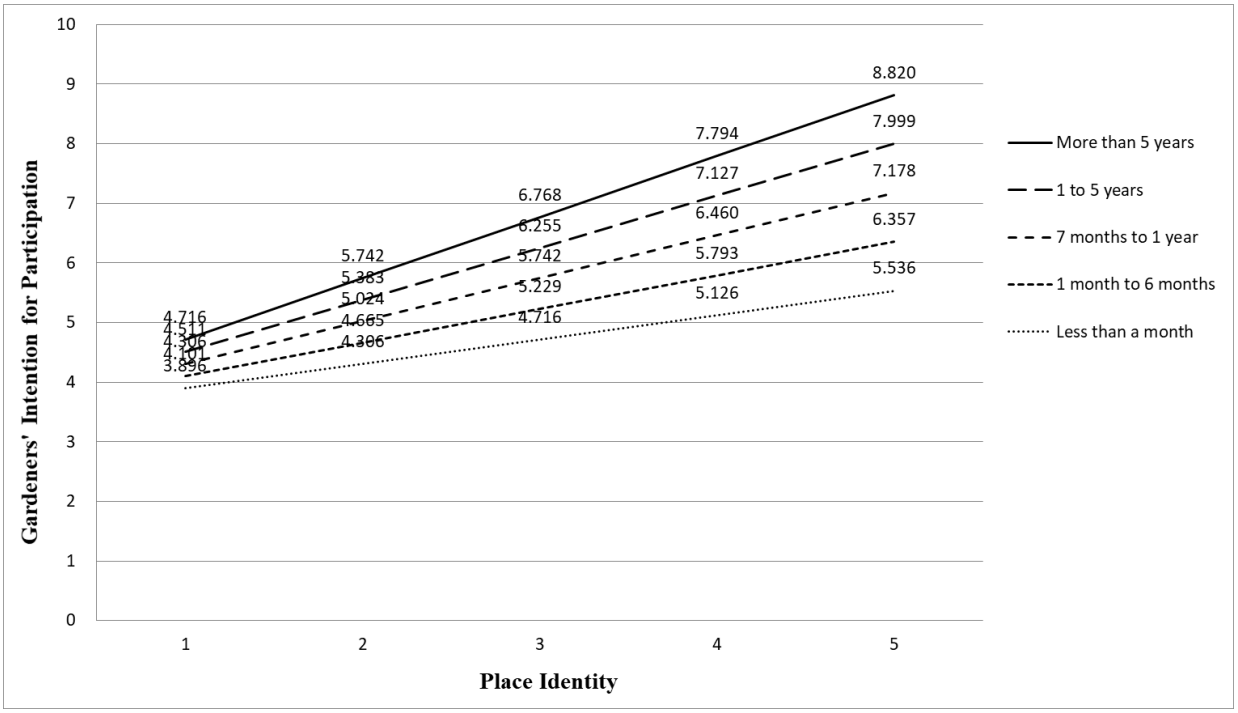

Figure 10 Place dependence (IV) * The duration of gardening (M) = Gardeners' intent for participation (DV).

Figure 10 demonstrates the moderating effect of duration of gardening on the relationship between place dependence and gardeners' intention to participate. Similar with the previous emotional factor, the effect of place dependence increases gardeners' intention to participate according to the duration of gardening. In other words, the effect of place dependence on gardeners' participation is higher in the case of long time gardeners than newer gardeners. Thus, the duration of gardening is also an important positive factor that increases gardeners' participation.

In the case of the frequency of garden participation, the same interaction terms were used, and the generated interactions were separately entered in step 3 of the regression (See Table 21). While the frequency of garden participation (i.e., moderator) was not statistically significant in

block models, both interaction terms were significant and explained significantly more variance than the model without those terms ($\beta_{PI*frequency} = .264$, $p < 0.001$, $\beta_{PD*frequency} = .167$, $p < 0.05$). Adding the interaction term between place identity and moderator to the model increased the proportion of explained variance from that associated with emotional variables and moderator (Adjusted R^2 increased from .196 to .261, $F = 7.266$, $p < 0.01$). Adding the interaction term between place dependence and moderator to the model slightly decreased the proportion of explained variance from that associated with emotional variables and moderator but interaction term was statistically significant (Adjusted R^2 decreased from .196 to .218, $F = 5.954$, $p < 0.05$).

Table 21 Hierarchy regression analysis for moderating effects (frequency of participation) on the relationship between emotional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2
Constant	3.370	3.338	3.355	3.340
Place identity (mc.x5)	.212*	.228*	.193*	.232**
Place dependence (mc.x6)	.245***	.236**	.241***	.211**
Frequency (mc.m2)		.059	.045	.053
mc.x5 * mc.m2			.222*** (.264)	
mc.x6 * mc.m2				.121* (.167)
Adjusted R^2	.184	.196	.261	.218
ΔR^2	.120***	.016	.066**	.026*

* $p < .05$ ** $p < .01$ *** $p < .001$
(Standardized)

We also executed a simple slope test to determine whether frequency of participation has a significant role as moderator ranging from less experienced (i.e., less than a month) to more experienced (i.e., more than 5 years). Both moderating effects in the case of place identity and

place dependence in each are depicted in Figure 11 and Figure 12, in which the X-axis indicates emotional variables and the Y-axis gardeners' intention to participate.

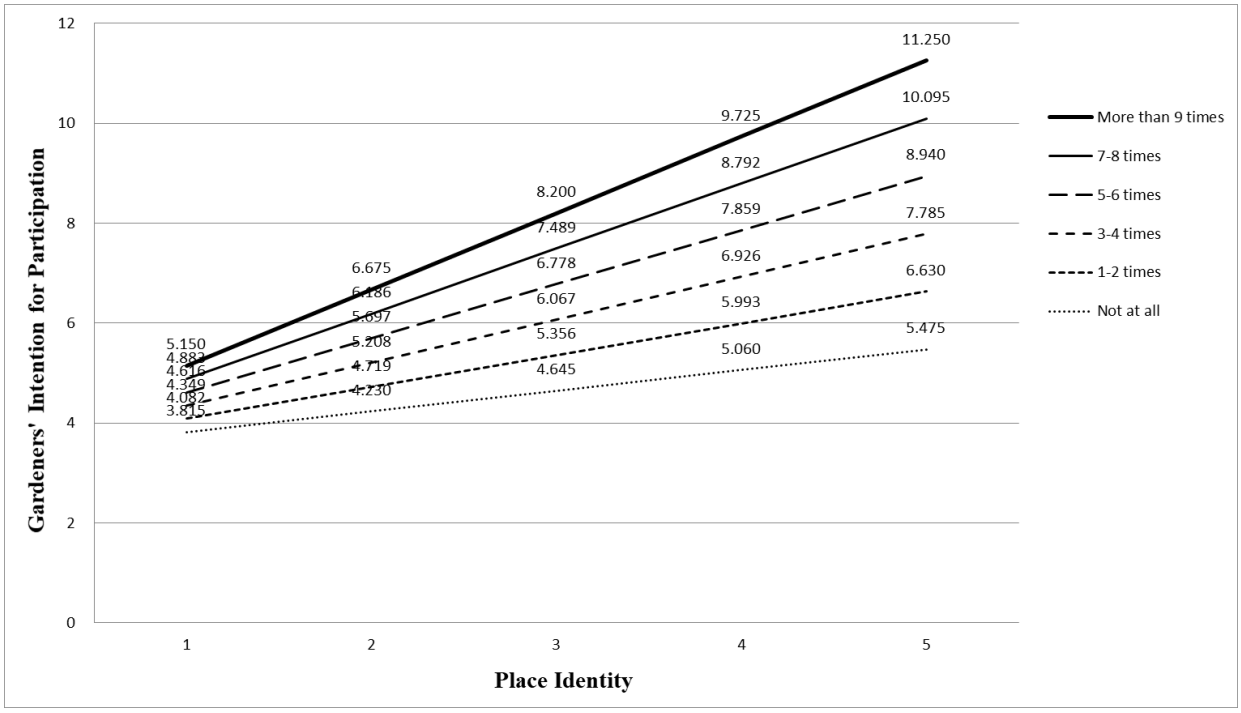

Figure 11 Place identity (IV) * The frequency of participation (M) = Gardeners' intent for participation (DV).

Figure 11 shows that place identity increases gardeners' intention to participate. However, this effect depends on the duration of gardening, which reinforces the power of place identity influencing gardeners' intention to participate. This means that active gardeners are influenced more on the effect of place identity on their participation than less active gardeners.

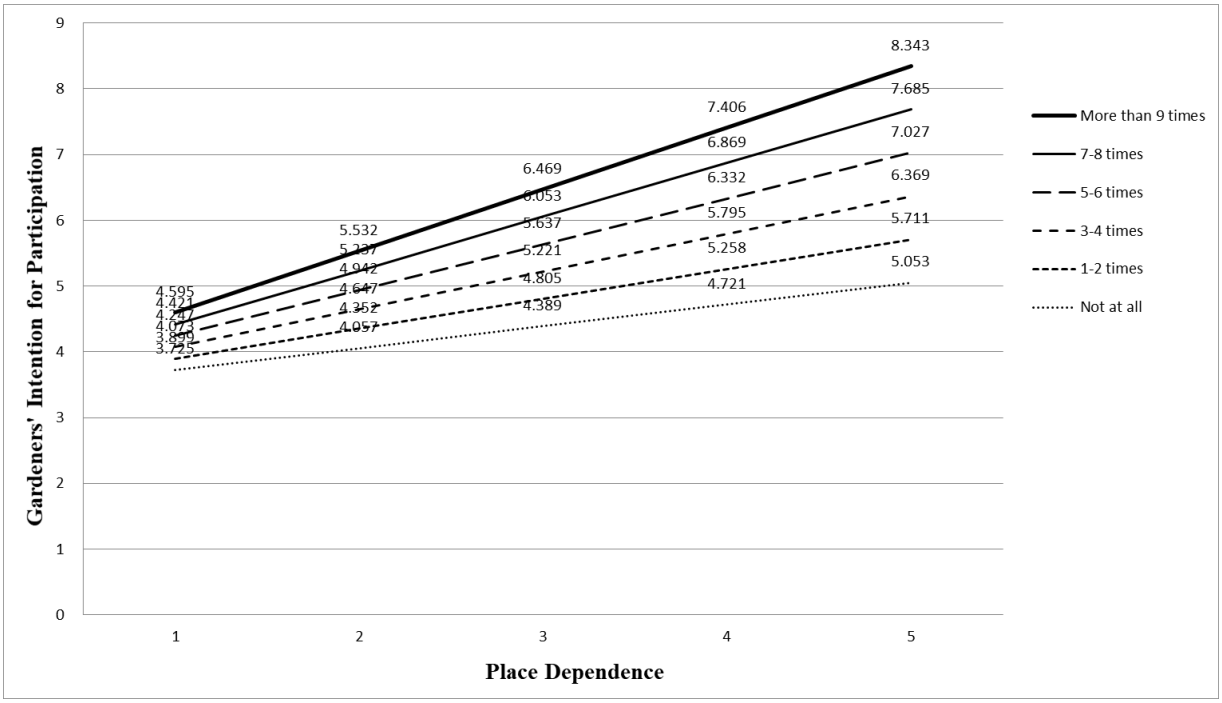

Figure 12 Place dependence (IV) * The frequency of participation (M) = Gardeners' intent for participation (DV).

Figure 12 demonstrates that higher levels of place dependence increases gardeners' intention to participate when gardeners participate in gardening more frequently. This means that the relationship between place dependence and gardeners' intention to participate is stronger when the frequency of participation is higher.

In sum, both the duration and the frequency of gardening facilitate the effects of place identity and place dependence on gardeners' intention to participate.

The Moderating Effects on the Relationship between Conditional motivations and Gardeners' Intention to Participate

Our sixth hypothesis was that gardeners' distinctive characteristics (i.e., duration of gardening and frequency of participation) may moderate the effect of conditional factors on gardeners' intentions to participate. In the case of duration of gardening, interaction terms were created between each of the conditional factors and duration of gardening, and the interactions were separately entered in step 3 of the regression (See Table 22). Time variable that was significant in multivariate model remained significant after introduction of a moderating variable and interaction terms, while none of the interactions were significant and explained significantly more variance than the model without those terms ($\beta_{skill*duration} = .073$, $p > 0.05$, $\beta_{time*duration} = .093$ $p > 0.05$, $\beta_{distance*duration} = .046$, $p > 0.05$). Thus, there were no significant effect of duration of gardening on the relationship between conditional factors and gardeners' intention to participate.

Table 22 Hierarchy regression analysis for moderating effects (the duration of gardening) on the relationship between conditional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2	Step 3-4
Constant	3.468	3.466	3.471	3.493	3.459
Gardening skills (mc.x7)	-.005	-.006	-.008	-.003	-.010
Time (mc.x8)	-.252***	-.252***	-.249***	-.238***	-.255***
Distance (mc.x9)	-.026	-.023	-.030	-.028	-.021
Duration (mc.m1)		.035	.034	.030	.032
mc.x7 * mc.m1			.041 (.073)		
mc.x8 * mc.m1				.065 (.093)	
mc.x9 * mc.m1					.037 (.046)
Adjusted R^2	.171	.169	.169	.172	.166
ΔR^2	.113***	.003	.005	.008	.002

* $p < .05$ ** $p < .01$ *** $p < .001$ (Standardized)

Regarding the frequency of garden participation, interaction terms were generated between each of the conditional factors and the frequency of garden participation. Each interaction term was separately entered in step 3 of the regression (See Table 23). Time variable that was significant in multivariate analysis remained significant after introduction of a moderating variable and each of the interaction terms, while none of the interactions were significant and explained significantly more variance than the model without those terms ($\beta_{skill*frequency} = .104$, $p > 0.05$, $\beta_{time*frequency} = .049$ $p > 0.05$, $\beta_{distance*frequency} = -.011$, $p > 0.05$). Similar with previous result, there were no significant effect of the frequency of garden participation on the relationship between conditional factors and gardeners' intention to participate.

Table 23 Hierarchy regression analysis for moderating effects (frequency of participation) on the relationship between conditional factors and gardeners' intention to participate.

	Step 1	Step 2	Step 3-1	Step 3-2	Step 3-4
Constant	3.468	3.446	3.442	3.448	3.444
Gardening skills (mc.x7)	-.005	-.011	-.018	-.012	-.011
Time (mc.x8)	-.252***	-.246***	-.250***	-249***	-.244***
Distance (mc.x9)	-.026	-.018	-.015	-.024	-.016
Duration (mc.m1)		.044	.044	.048	.044
mc.x7 * mc.m1			.042 (.104)		
mc.x8 * mc.m1				.024 (.049)	
mc.x9 * mc.m1					-.006 (-.011)
Adjusted R^2	.171	.175	.181	.172	.170
ΔR^2	.113***	.009	.010	.002	.000

* $p < .05$ ** $p < .01$ *** $p < .001$ (Standardized)

CHAPTER VI

CONCLUSION

Discussion on Research Findings

This study has explored different motivational factors, beyond previously well-known functional motivations, related to gardeners' participation. Its aim has been to examine the roles of emotional and conditional factors in influencing community garden participation, and further how gardeners' different characteristics influence each relationship. We hypothesized that gardeners' intention to participate was positively associated with H1) functional factors and H2) emotional factors, but negatively associated with H3) conditional factors. Regarding gardeners' different characteristics, we hypothesized that the duration of gardening and the frequency of garden participation may moderate the effect of H4) functional, H5) emotional, and H6) conditional factors on gardeners' intention to participate.

The result of bivariate analysis has shown the correlation between most factors used in our study. These findings indicated the need for further examination in terms of the relationships between independent variables and the dependent variable. To predict the influences and to test how different motivational dimensions influence gardeners' intention to participate, we concluded that a series of block regressions would be the most appropriate for this study. We found that four of the study's hypotheses were partially or fully supported (Hypotheses 1, 2, 3, 5), while two hypotheses were not supported (Hypothesis 4, 6). Details of each finding are described below.

Hypothesis 1: There is a positive association between functional factors and gardeners' participation

In the case of Hypothesis 1, when the effects of the rest of the variables in the model were controlled, there was statistical significance for most of the factors in the model tested through the regression analysis. In other words, our study results supported the hypothesis that, overall, a gardener's functional motivations were positively associated with their level of intention to participate. Motivations such as a desire for accessing fresh food, keeping personal health, and enjoying being outdoors had statistical relationships with gardeners' intention to participate in community gardens, while a desire for socializing with other gardeners was not significant. These findings are in line with previous community gardening literature (e.g., Birky & Strom, 2013; Draper & Freedman, 2010) that emphasized that gardeners are driven by their utilitarian needs.

Notably, the motivation of enjoying being outdoors was the strongest factor influencing gardeners' intention to participate. In the case of three community gardens in Austin, most gardeners, who have higher socio-economic status than other community gardeners in other research (e.g., marginalized communities), appreciate the opportunity to spend time outdoors especially in urban areas like Austin according to our study. This finding is similar to prior research that noted gardeners who have higher income and education are more likely to participate in community gardens motivated by enjoying leisure activities and interacting with nature rather than accessing food (O'Neal, 2009). Nevertheless, a desire for accessing to fresh food and vegetables was also significant in our study. This is similar with recent research noted that affluent gardeners are also interested in accessing fresh food (Flachs, 2010), which are

further supported by Birky and Strom (2013) that food insecurity cannot fully take into account a recent increase of community gardening programs. Thus, the most possible explanation for this result is that gardeners in studied areas are likely to participate in gardening to access health food free of pesticides, organic food products, or unique vegetables that cannot be easily obtained in grocery stores.

The social motivations of community gardens have been widely known in previous gardening literature that social life in the garden is deemed important to the plot holders. For instance, Baker (2004) and Teig et al. (2009) emphasized that social opportunities in community gardens (e.g., garden potlucks, craft days, and cooking classes) are attractive factors for those who have not had much chance to meet with neighbors in urban areas. However, the result in our study showed that socialization at the garden was not statistically significant, indicating that a desire for socialization with other gardeners was not associated with gardeners' motivation to participate in gardening. Our result supported the most recent qualitative research that informal social contact was not a necessarily the reason to participate for urban gardeners (Nordh et al., 2016). In other words, it is plausible that community gardeners are attracted by diverse social events and activities held in gardens (other than gardening activities); however, a desire for social interaction does not directly influence gardeners' intention to participate as suggested by Veen, Bock, Van den Berg, Visser, and Wiskerke (2016).

Hypothesis 2: There is a positive association between emotional factors and gardeners' participation

In the case of Hypothesis 2, when the effects of the rest of the variables in the model were controlled, our analysis found that both dimensions of gardeners' emotional motivations

were positively associated with their intention to participate. In this study, we measured gardeners' emotional motivations through their attachment to their community garden. As shown in the result of multivariate analysis (Table 17), place identity and place dependence under the construct of place attachment were strongly associated with gardeners' intention to participate, which means that gardeners' willingness to participate in their garden was strongly linked to their self-identity with the garden as well as the specific conditions of their garden.

We analyzed these relationships because previous place attachment studies (e.g., Anton & Lawrence, 2016; Estrella & Kelley, 2017) have shown the result that the varying participation level can stem from people's different levels of attachment to the place. Our results also showed similar results that the physical garden space evoked gardeners' emotional feelings and their attachment toward the garden. This finding, particularly focused on place identity, aligns with recent community gardening literature noting that gardeners gradually adapt and reshape their personal identity while engaging in gardening activities (Flachs, 2010; Poulsen et al., 2014). Especially in urban settings like Austin, the study result is similar with research finding conducted in Oslo, the capital of Norway that the gardeners perceive gardening activities as opportunities for personal expression, such as a farmer in the city and desire to define their way of life as gardening life, as opposed to apartment life (Nordh et al., 2016).

In place attachment research, typically, there is a high correlation between place identity (i.e., symbolic meanings given to a place) and place dependence (i.e., the quality of a setting to satisfy a specific goal), indicating that high place identity is associated with high place dependence (Jorgensen & Stedman, 2006; Read, Brown, Thorsteinsson, Morgan, & Price, 2013). Our study results also found similar relationship between place identity and place dependence, as most leisure studies (Jorgensen & Stedman, 2006; G. T. Kyle, Absher, & Graefe, 2003; Lin &

Lockwood, 2014) have found that recreationalists are driven by the quality of a setting to satisfy a specific goal. In community garden contexts, however, the nature of gardening activities, as a type of recreation, is less to require specific conditions or settings (as opposed to rafting or kayaking). Although gardeners are less likely to differentiate or value the physical attributes of their community garden from other gardens, the significant result of place dependence can be explained by gardeners' high level of ownership and their responsibility to their plots, leading them to participate in gardening, as noted by Eizenberg (2012) and Pearson and Firth (2012). Such strong functional bonds to a specific garden is less likely transferable to another garden (Raymond, Brown, & Weber, 2010).

Hypothesis 3: There is a negative association between conditional factors and gardeners' participation

Regarding Hypothesis 3, when the effects of the rest of the variables in the model were controlled, the negative effect of conditional factors on gardeners' intention to participate was partially supported. Of the conditional factors, time availability was statistically significant, while gardening skills and physical proximity were less important demotivating participation factors. The result indicated that, overall, lack of time was the most significant demotivating factor, negatively influencing gardeners' willingness to participate. The study finding is in line with previous research conducted by Poulsen et al. (2014) that gardeners are often challenged by the unexpected amount of time required to maintain their plots and communal spaces (Poulsen et al., 2014).

The lack of gardening skills, as related to managing pest and invasive plants, has been referred to in many studies as one of the most deterring components for gardeners' intention to

participate. However, our finding did not support previous work that the level of gardening skills play less of a role in deciding gardeners' participation. A possible explanation for this result may be that a proportion of gardeners in the three gardens according to our study were mostly older and experienced gardeners, as similar with the result conducted by Bartolomei et al. (2003) and Birky and Strom (2013). In this setting, gardening skills were less of an issue for gardeners in this study.

Physical proximity to gardens is also mentioned in practical community gardening research (e.g., Drake & Lawson, 2015). However, in this study, physical proximity did not play a role in influencing gardeners' intention to participate. The most plausible explanation for this result is that most gardeners tend to consider community gardens on the basis of their physical distance to their home when joining a membership rather than their decision being driven by some specific relations or organizations (e.g., church). Additionally, most community gardens prioritize potential members who live nearby in waiting lists because of concerns about lack of participation. In this study, respondents, who are already members, were less likely to feel constraints due to the physical proximity to gardens.

Hypothesis 4: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of functional factors on gardeners' intentions to participate

In the case of Hypothesis 4, we analyzed the effect of moderating variables because the effects of the duration of gardening and the frequency of participation have not been investigated yet in community garden studies. We hypothesized that both moderators facilitated the contributions of functional factors on gardeners' intention to participate. However, the results

showed that no interaction terms were significant regarding the associations between functional factors and their intention to participate.

It is noteworthy that there were no statistical differences between experienced versus less experienced as well as active versus less active gardeners regarding the effects of functional motivations on their intention to participate. These findings are not only consistent with a number of previous community gardening studies (e.g., Flachs, 2010; Guitart et al., 2012), but also extend the previous findings that, regardless of gardeners' duration of gardening and their frequency of participation, the level of gardeners' functional motivations seems to differentiate less according to gardeners' different characteristics. It is important to note that the strength of the effect of functional motivations did not increase or decrease based on the duration of gardening.

We assumed that there would be statistical differences between long time and newer gardeners regarding the less significant functional factor: a desire for socializing with other gardeners. However, the result did not support our hypothesis. Possible explanations for the result may most likely be attributed to the different characteristics of community gardens. For instance, gardeners in communal gardens (one large single plot) tend to have more time to work and socialize with other gardeners, while gardeners in allotment gardens (a collection of individual plots) are less likely to cooperatively work with other gardeners other than service hours. If we extend our study to include communal gardens, then a statistical difference might be observed.

Hypothesis 5: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of emotional factors on gardeners' intentions to participate

Regarding Hypothesis 5, we found that both moderators (i.e., duration of gardening and the frequency of participation) facilitated the contributions of emotional factors (i.e., place identity, place dependence) on gardeners' intention to participate. This indicates that the influence of emotional factors on gardeners' intention to participate contributes more to experienced and active gardeners than less experienced and less active gardeners, respectively.

As consistent with the result of multivariate analysis (see Table 17), when each moderator was separately introduced in the regression model, both emotional contributions (i.e., effects of place identity and place dependence) were statistically significant. In other words, emotional contributions to gardeners' intention to participate became stronger for gardeners who had been gardening longer or more frequently participated in gardening than those who had less experience or participated less in gardening, respectively. Such findings are noteworthy in that the effects of gardeners' different characteristics are more likely attributed to differences in gardeners' emotional motivations instead of functional or conditional factors.

Also, these findings confirmed previous assumptions that time spent and the level of experience in community gardens increases gardeners' psychological linkages toward their gardens (Dunlap et al., 2013). Such emotional attachment also encourages gardeners' greater sense of ownership and responsibility to their plots over time (e.g., Eizenberg, 2012; Pearson & Firth, 2012), findings that are further supported by our results. Thus, beyond the finding of linkages between gardeners' self-identities as gardeners and their willingness to participate

(Hypothesis 2), more importantly, these findings provide better understanding that gardeners' emotional attachment developed from their long-time gardening and active participation encourages more stable intentions to participate in their community gardens.

It is noteworthy that, in both cases of duration of gardening and frequency of participation, the effects of place identity were consistently stronger than the effects of place dependence, as shown graph slopes compared in Figure 9 and 11 and Figure 10 and 12. This indicated that the contributions of gardeners' level of place identity were stronger than the effects of place dependence on gardeners' intention to participate. These results in this study are in line with other recreational studies that noted that the level of recreational skills and the level of time investment are more associated with the level of place identity than place dependence (Bricker & Kerstetter, 2000; Hammitt, Backlund, & Bixler, 2004; Moore & Graefe, 1994).

Hypothesis 6: The distinctive characteristics of gardeners (i.e., duration of gardening, frequency of participation) may moderate the effect of conditional factors on gardeners' intentions to participate

In the case of Hypothesis 6, neither effects of the duration of gardening nor the frequency of participation on the relationship between conditional factors and gardeners' intention to participate were supported. This result showed that the effects of conditional factors on gardeners' intention to participate did not depend on the value of either moderator, indicating that the contributions of conditional factors on gardeners' intention to participate have no statistical differences between experienced and less experienced as well as active and less active gardeners.

We assumed that there would be differences between long time gardeners and newer gardeners in terms of time constraints; newer gardeners would feel more time constraints than experienced gardeners. However, the study results did not support our hypothesis. The most plausible explanation for this result is that, although lack of time is a general issue that most gardeners face (as described in Hypothesis 3), the finding does not lead to the conclusion that people who feel more challenged by time constraints are the ones who participated less in gardening. For instance, some gardeners who indicated lack of time as the most serious challenge may participate less, while some gardeners who participate more than other gardeners still express lack of time as the strongest deterrent. In other words, the challenge of lack of time is not only relevant to less experienced or less frequently participating gardeners, but also to experienced and frequently participating gardeners.

In addition, we assumed that there would be some differences regarding gardening skills and physical distance to gardens when moderators were introduced. This is because, when the association between these two conditional factors and the dependent variable was weak, the introduction of moderators may strengthen or weaken the relation. However, neither moderator was statistically significant influencing both relationships between conditional factors and gardeners' intention to participate. Previous research noted that the challenges of managing pests and invasive plants were often faced by newer gardeners (Mast, 2013); however, our result in this study did not provide statistically significant evidence regarding different levels of challenges between long time versus newer gardeners.

Theoretical Implication

From a theoretical perspective, this study has empirically supported multidimensional approaches that emphasize that, beyond the effect of functional motivations, emotional motivations should be included to examine more predictive people's behavioral intentions. Such a dual motivation approach has been largely utilized to better understand the relations between people's values and their behavioral intentions, mostly in the event or tourism studies, such as studies of festival attendance or intention to revisit (e.g., Budruk & Lee, 2016; Lee, Lee, & Yoon, 2009). The merits of multidimensional approaches have been applied in recreational settings, particularly in community garden contexts, to behavioral analysis.

Previous community gardening literature has attempted to measure the relationships between gardeners' motivations to participate in gardening. However, such studies (e.g., Carney et al., 2012; Litt et al., 2011) are limited to measuring their functional motivations (e.g., vegetable intake, food security) targeting volunteers, rather than garden members. As highlighted in our study's objective, this paper seeks to uncover the effect of emotional factors rather than functional factors, targeting gardeners who regularly participate in gardening. For this reason, this study differed from previous studies by not only targeting official members of community gardens, but also measuring their emotional influences on routinely performing behaviors (e.g., gardening). In this sense, this study is the first quantitative study that investigates people's emotional motivations on their routine behaviors, particularly in community garden settings. More importantly, previous studies utilized place sentiment or place meaning to understand the effect of emotional factors on garden participation (e.g., Dunlap et al., 2013; Krasny et al., 2014), but this study has utilized measures of place attachment as a particular emotional factor, which has not been explored in the context of community gardens.

While past two-dimensional motivational approaches offer useful insights in leisure studies, this study added another perspective to better take into account people's behavioral intention. In a community garden context, garden participation is contingent on particular situations (e.g., unexpected events) (Hagelman III et al., 2016; Milburn & Vail, 2010). We assumed that introducing the additional motivational factor (i.e., conditional factors) into the multidimensional model would improve the prediction of behaviors. In this study, the addition of emotional and conditional dimensions is not to undermine the role of functional factors, but to acknowledge that the inclusion of all three factors allows for a more complete assessment of recreational behavioral intention.

Beyond the importance of direct attitudinal effect on recreational behavioral intention, this study has supported the effect of contextual factors influencing emotional contributions. The previous recreation literature has revealed that the length of recreation involvement and the frequency of recreation use are positively associated with place attachment (Lalli, 1992; Moore & Graefe, 1994). Such studies have mostly been conducted in natural resource management in amenity-rich communities rather than in physical/urban natural settings in urban communities (Stedman, Amsden, & Kruger, 2006). However, the study revealed that similar findings were applicable in urban natural settings; in the community garden context; for example, the longer and the more participating gardeners had greater levels of attachment toward their garden than their counterparts. Academic researchers can benefit from an awareness that such contextual variables are associated with emotional factors, regardless of the different context of recreational settings either in amenity-rich communities or urban natural settings.

A number of community development studies (e.g., Comstock et al., 2010; Wakefield et al., 2007) have traditionally dealt with community garden participation as one of the important

factors measuring the level of neighborhood or community attachment because of the roles of developing social capital in community gardens (Pearson & Firth, 2012; Teig et al., 2009). As a result, gardeners who participated in community gardens were deemed as local residents who have higher levels of community attachment, such as rootedness in the community, sense of community, neighborhood cohesion, and level of social interaction (Comstock et al., 2010). However, while people who hold high degree of emotional bonds with their neighborhood tend to participate in community gardens more than those who are less rooted, community gardeners are not necessarily the ones who have a strong emotional attachment to their community (Clark & Manzo, 1988). Recent literature (Firth et al., 2011; Poulsen et al., 2014) supported this argument that gardeners are likely to participate in their territorialized garden plots (personal motives), not motivated by socializing with neighbors (community values). This theoretically lack of connection between community attachment and participation at the garden can be explained by our study findings that highlighted emotional factors above social factors.

A few recent community attachment studies (Matarrita-Cascante et al., 2010; Pretty, Chipuer, & Bramston, 2003; Stedman et al., 2006) have extended the scope of community attachment into the physical interaction with natural settings, beyond social activities that people engage in. These studies identified that people's experiences and emotional connections with local natural landscape in amenity-rich communities play a role in influencing community attachment. Furthermore, the more recent community attachment studies (Xu, 2015) showed that the physical interaction with natural environment in urban settings can also be applied in attachment in urban communities. Given the importance of interaction of physical/natural landscape in community attachment, the empirical findings of gardeners' emotional attachment toward their community gardens in this study can better connect the relations between

community garden participation and the level of community attachment in community gardening literature. Also, these findings would benefit for solidifying the inclusion of the physical/natural landscape in community attachment literature, which has not been much studied in urban natural settings.

Practical Implications

This study has some practical implications for the management of community gardens. Currently existing community gardening literature has responded to the question of why people participate in gardening and what the benefits resulting from participation are. While the benefits to participate in community gardens have been widely explored, the question of what makes sustainable participation under the realm of management has not much been dealt with in the community gardening literature yet. Given the gap, this study suggests a first empirical study in thinking of keeping sustainable participation in community gardens rather than repetitively highlighting the functional benefits and motivations of community gardening. For this purpose, we aimed to reveal the effects of emotional and conditional factors, which may sustain or diminish community garden participation.

Practical implications can be drawn from the distinction of gardeners and their different motivations. In our study, we found that long time and newer gardeners were not distinct in the effect of functional motivations determining their participation. That is, for both groups, desires for accessing food, keeping personal health, and enjoying being outdoors were common components leading them to participate in gardening. The noteworthy findings were revealed in this study that significant differences were observed in the effect of emotional factors. In other words, we may conclude that sustainable participation in gardening is most likely attributed to

gardeners' different levels of emotional attachment toward their gardens rather than their functional motivations. The findings are in line with previous literature that noted community gardens cannot be sustained without a few long term and active gardeners (Birky, 2009).

In this regard, it is important for garden managers to realize that community garden participation is driven by multidimensional motivations. Beyond a consideration of functional motivations (e.g., cultivation of food and vegetables), as shown in the result of emotional factors, garden managers need to focus more on gardeners' experiences and their emotional feelings at the garden. Particularly, in urban areas, where large natural areas are lacking, gardeners are likely to interact with natural settings. Even in small scale community gardens, gardeners can experience 'being away' from the surrounding built environment, and they can take a rest, enjoy, and experience restoration while participating in gardening activities (Nordh, Hartig, Hagerhall, & Fry, 2009; Van Den Berg & Custers, 2011). In urban parks, city dwellers experience active forms of recreational activities (e.g., sports), whereas garden organizers and managers need to emphasize more on how gardeners can experience more restorative environments in therapeutic landscapes.

In addition, social interaction between gardeners should be the merit of community gardens. Although the motivation of social interaction was not statistically significant according to this study's results, garden managers should be aware that encouraging social interaction between gardeners is necessary for sustaining stable involvement. This is because establishing new relationships between gardeners helps to increase the participation rate. For example, Milligan et al. (2004) note that the increased interactions between older populations foster friendship and well-being, contributing increased participation rate. Another example shows that when there are active relations between experienced and newer gardeners, not only is social

capital generated, but also newer gardeners can learn gardening techniques from experienced gardeners (Birky & Strom, 2013; Flachs, 2010). In other words, such an increased social interaction, despite superficial ties, will lead to creating a social network between gardeners (de Vries, 2010), and further, promoting gardeners' responsibility and sense of ownership for the success of community gardens in the long run (Adevi & Mårtensson, 2013).

Study Limitations and Suggestions for Future Research

This study has several limitations. First, the study findings are limited to the specific type of community garden. As mentioned earlier, community gardens can be categorized based on the locations, management types, purposes, and sizes etc. This study and its findings are limited to the allotment garden, specifically in Austin, Texas. The findings cannot be applicable to other community garden types or allotment gardens in other cities. In future studies, it would be fruitful to include other types of community gardens (e.g., communal gardens) to test how each predictive factor differs across different locations and contexts.

The second limitation in this study is the lack of diverse characteristics of gardeners. A large number of gardeners who completed the survey in Austin were those who identified themselves as white/Anglo (73.3%), well educated (4-year College/University Bachelor's degree or above: 81.1%), and mostly earn a higher annual income (more than $50,000: 63.2%). For this reason, the findings in this study may vary in other community gardener populations studied elsewhere (e.g., gardens that are made up of marginalized or financially poor). Additionally, the data clearly showed that more significantly long term gardeners completed the survey than newer gardeners in all three community gardens. Even though such a pattern is mostly observed in other community garden studies (e.g., Birky & Strom, 2013), if there was a heterogeneous

sample (involve diverse groups of people), in addition to a larger sample size, the detection level depending on gardeners' different characteristics may increase to reveal more statistically significant observations.

The third limitation is the challenge of defining the level of long time and active gardeners. For example, gardeners who participated 1-2 times last month seemed less active, but can be classified into active gardeners when compared to those who never showed up at the garden. Most gardeners who deemed less active in this study responded 'strongly agree' or 'agree' on their intention to participate. Such a lack of variation regarding their level of intention limited us from revealing statistically significant differences in terms of conditional effects between less active versus active gardeners. Thus, further research should be able to recruit non-gardeners, specifically the people who quit gardening, to better understand their attitudes toward their intention to participate.

Fourth, the dependent variable, which used to measure gardeners' participation, was not actual participation but their intention to participate. Although intention is the most used to predict actual behavior, when routinely performing behaviors, like gardening in this study, intention may play less of a role in influencing future participation (Ouellette & Wood, 1998). Also, reliance on one construct to assess gardeners' participation may decrease the accountability of gardeners' actual behaviors. For this reason, future work should employ more diverse measures to examine gardeners' participation (e.g., satisfaction, continuation intentions).

Fifth, the study results showed that emotional factors were statistically significant and positively related to gardeners' intention to participate. Although the findings further examined the moderator effects (i.e., the length of gardening, the frequency of participation) in relation to emotional factors, this study did not examine how such gardeners developed their emotional

feelings at the garden, such as experiencing natural or therapeutic environments. In this sense, community garden literature can be enriched by identifying how functional motivations (or other motivations) are translated into an emotional attachment to their gardens.

Sixth, this study demonstrated the important effects of emotional factors in influencing gardeners' intention to participate, particularly when gardeners were classified into long term versus newer gardeners or active versus less active gardeners. This study used place attachment as a substitute for one of the emotional factors, but it is fruitful to incorporate more additional emotional measures to examine their effects on gardeners' intention to participate and discover how the effects differ with a place attachment construct.

Lastly, a potential limitation of our survey responses is a recall bias. Since our survey relied on gardeners' memory and their ability to respond, their answers may not be accurate because of the difficulties with recall. Such challenges can be susceptible to biases that may affect the quality of data and results. Also, since the data collection was conducted for three months, gardeners' responses might also have depended on the weather conditions (e.g., rain). While the data could represent a wide range of gardeners, the specific question regarding the frequency of participation could be varied depending on when each gardener was asked to participate in the survey.

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APPENDIX A

Survey Questionnaire

The Influence of Emotional and Conditional Factors on Gardeners' Participation in Community Gardens

Department of Recreation, Park and Tourism Sciences
College of Agriculture and Life Sciences
AGLS Building, 2261 TAMU, College Station, TX, 77843-2261

Dear Participant,

My name is Jae Ho Lee, and I am a Ph.D. student in the Department of Recreation, Park, and Tourism Sciences at Texas A&M University, majoring in Community Development. The purpose of this survey is to better understand multiple aspects associated with community gardening that can help residents of this neighborhood engage more in gardening.

I appreciate if you could please take a few moments (about 10 minutes) to answer the following questionnaire. There is no risk involved in participating in this survey, and your identity will be kept confidential to the extent provided by law. The contact information requested at the end of the survey questionnaire will only be used to contact gardeners who want to participate in a follow up interview.

By completing the survey, you are giving me your permission to use your responses for use in research publications and presentations.

If you are willing and able to participate in the study, please click the next button to get started.

Thank you for your participation in this research project.
Yours sincerely,
Jae Ho Lee

Section One: Your Experience with Community Gardens

Please fill out the following survey questions to the best of your ability. Indicate your response by circling the letter that corresponds to your answer. (Here we refer to participation BEYOND maintenance of your personal plot, i.e., garden service hours)

1. Which garden do you belong to?

a. Sunshine Community Garden
b. Festival Beach Community Garden
c. Adelphi Acre Community Garden

2. How long have you been gardening in this garden?

a. Less than a month
b. 1 month to 6 months
c. 7 months to 1 year
d. 1 to 5 years
e. More than 6 years

3. How long have you been gardening overall?

a. Less than a month
b. 1 month to 6 months
c. 7 months to 1 year
d. 1 to 5 years
e. More than 5 years

4. **How many times** did you participate in this community garden **last month**? (Include your service hours)

a. Not at all
b. 1-2 times
c. 3-4 times
d. 5-6 times
e. 7-8 times
f. More than 9 times

5. **How many hours** did you work at the garden **last week**? (Include your service hours)

a. Not at all
b. 1-2 hours
c. 3-5 hours
d. 6-9 hours
e. More than 10 hours

6. How many minutes does it usually take you to get to or from the garden?

_____minutes

7. Do you usually travel between your home and the garden directly, or to/from some other place such as work or school?

a. Between home and the garden b. From some other place

8. How do you feel about this garden (Please select the circle that best explains how much you agree or disagree with **each** statement)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. This garden means a lot to me	1	2	3	4	5
b. I am very attached to this garden	1	2	3	4	5
c. I strongly identify with this garden	1	2	3	4	5
d. I have special connections to this garden and the people who visit it	1	2	3	4	5
e. I enjoy visiting this garden more than any other gardens	1	2	3	4	5
f. I get more satisfaction out of visiting this garden than from any other garden	1	2	3	4	5
g. Visiting this garden is more important than visiting any other gardens	1	2	3	4	5
h. I would not substitute activities at other gardens for the activities I do here	1	2	3	4	5

Section Two: Attitudes about Gardening

Please answer each of the following questions by circling the number that best describes your opinion. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully.

9. For me, participating in gardening is …"

Extremely boring	1	2	3	4	5	Extremely interesting

Extremely harmful	1	2	3	4	5	Extremely beneficial
Extremely worthless	1	2	3	4	5	Extremely valuable

10. For me, how important is _____ by participating in this garden to you?

	Extremely unimportant				Extremely important
a. accessing fresh food	1	2	3	4	5
b. enjoying being outdoors	1	2	3	4	5
c. enhancing bodily health	1	2	3	4	5
d. improving psychological well-being	1	2	3	4	5
e. socializing with other gardeners	1	2	3	4	5
f. participating in social activities	1	2	3	4	5
g. connecting with nature	1	2	3	4	5

11. Most people who are important to me _____ me to participate in this garden.

Discourage	1	2	3	4	5	encourage

12. The people in my life whose opinions I value _____ of me participating in this garden.

Disapprove	1	2	3	4	5	Approve

13. Please answer each question as honestly as possible.

	Extremely unlikely				Extremely likely
a. If I spend too much time in this community garden, my family members discourage me from participating.	1	2	3	4	5

b. If I routinely fail to participate in this community garden, I feel pressure from my neighboring gardeners.	1	2	3	4	5
c. If my plot(s) are poorly maintained, I feel pressure from the garden managers.	1	2	3	4	5

14. For me, to participate in gardening is.

Very difficult 1 2 3 4 5 Very easy

15. Whether or not I participate in gardening is entirely up to me.

Strongly disagree 1 2 3 4 5 Strongly agree

16. How much personal control do you feel you have over participating in gardening.

Very little control 1 2 3 4 5 Complete control

17. How often do you feel that _____ make(s) participation in your community garden difficult?

	Never				Frequently
a. lack of time	1	2	3	4	5
b. distance from a garden	1	2	3	4	5
c. the difficulty of managing pests and invasives	1	2	3	4	5
d. lack of gardening skills	1	2	3	4	5
e. large plot to maintain	1	2	3	4	5
f. service hours requirements	1	2	3	4	5

18. Please answer each question as honeslty as possible.

	Strongly disagree				Strongly agree
a. I intend to keep participating in this community garden.	1	2	3	4	5
b. I have decided to keep participating in this community garden.	1	2	3	4	5
c. I expect to keep participating in this community garden.	1	2	3	4	5

Section Three: Personal Characteristics

19. What is your gender?

a. Male b. Female

20. What is your age?

a. 19-29
b. 30-39
c. 40-49
d. 50-59
e. 60-69
f. > 70

21. What is the zip code of your residence? _____

22. What is the highest level of education you have completed?

a. Less than a high school degree
b. High school degree or GED
c. Some college
d. Trade/technical/vocational training or associate degree
e. 4-year College/University Bachelor's degree
f. Advanced degree (Master's, Ph.D., JD, MD)

23. What is your race/ethnicity? (Please ✓ check ONE that best applies)

a. Asian
b. Black or African American
c. Hispanic or Latino
d. White/Anglo
e. Other (please specify)_____

24. What is your marital status?

a. Single b. Married/living with partner

c. Married/not living with partner
d. Divorced/separated
e. Widower/widow

25. Employment Status: Are you currently…?

a. Employed for wages
b. Self-employed
c. Out of work and looking for work
d. Out of work but not currently looking for work
e. A homemaker
f. A student
g. Military
h. Retired
i. Unable to work
j. Other (please specify)_____

26. Including yourself, how many people are living in your household at present time? _____

27. How many children age 5 or younger do you currently have living at home? _____

28. How many children age 6 to 18 do you currently have living at home? _____

29. What was your total household annual income before taxes for 2015?

a. Less than $10,000
b. $10,000 to $14, 999
c. $15,000 to $24,999
d. $25,000 to $34,999
e. $35,000 to $49,999
f. $50,000 to $74,999
g. $75,000 to $99,999
h. $100,000 to $149,999
i. $150,000 to $ 199,999
j. $200,000 or more

Here, I would like to leave space for you to add any additional comments related to this survey.

_____

_____

_____

Thank you very much for your participation. I appreciate your assist.